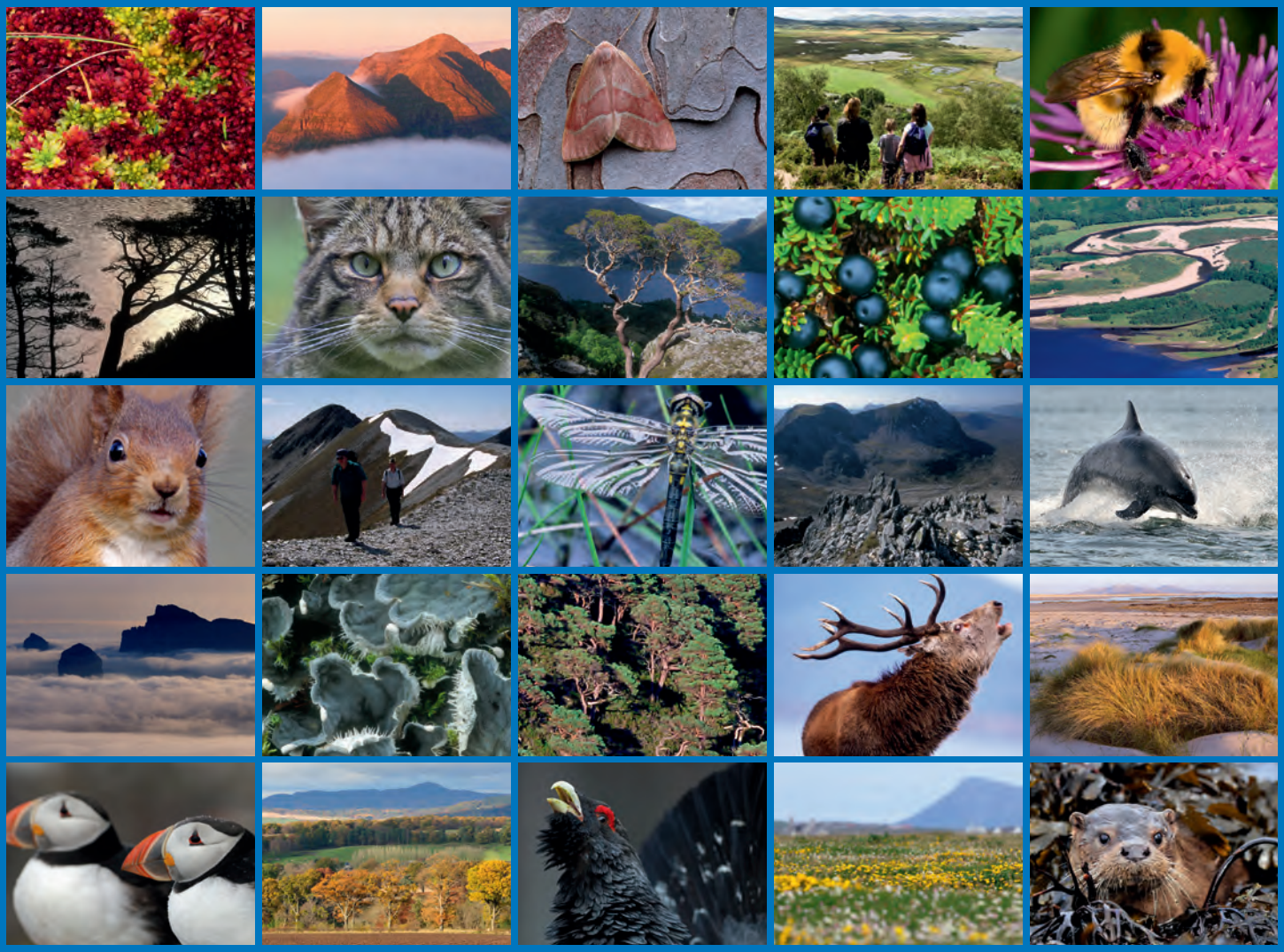
Scottish Natural Heritage
Commissioned Report No. 446

An assessment of the conservation importance of species and habitats identified during a series of recent research cruises around Scotland



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COMMISSIONED REPORT

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An assessment of the conservation importance of species and habitats identified during a series of recent research cruises around Scotland

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COMMISSIONED REPORT

Summary

An assessment of the conservation importance of species and habitats identified during a series of recent research cruises around Scotland

Commissioned Report No. 446 (Project no. PP323)
Contractor: Dr Colin Moore
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Background

To help target marine nature conservation in Scotland, SNH and JNCC have generated a focused list of habitats and species of importance in Scottish waters - the Priority Marine Features (PMFs). The principal aim of the present investigation was to improve knowledge of the occurrence and distribution of species and habitats of recognised conservation importance in Scottish waters, especially PMFs, but also taking into consideration other importance measures. This was to be achieved through the analysis of seabed video and still photographic imagery collected during research cruises around Scotland in 2009 and 2010, largely by Marine Scotland Science. A further aim was to assess the implications of renewable energy developments on the features of importance, where they occurred in areas likely to experience such developments.

Imagery was analysed from surveys at 15 locations. These included Fair Isle, Westray Firth (Orkney), west of Mainland Orkney, eastern Scapa Flow (Orkney), east of South Ronaldsay (Orkney), in the Sound of Stroma (Pentland Firth), off Noss Head (Caithness), off northwest Lewis, south of the Crowlin Islands (Inner Sound), Kyle Rhea, in the Sound of Canna (Small Isles), east of Mingulay, around Tiree, north of Islay and off the west coast of the Kintyre peninsula.

Main findings

- Fourteen species and 17 habitats of conservation importance were recorded
- There were firm records of seven species PMFs. Ling *Molva molva* was recorded amongst rocks at the exposed West Mainland and Lewis locations. The tall seapen *Funiculina quadrangularis* was found to be abundant at the southern entrance to Kyle Rhea and present, together with the fireworks anemone *Pachyceranthus multiplicatus*, to the south of the Crowlin Islands at over 200 m and off Mingulay at 95-183 m. The Mingulay area also supported extensive fields of dense northern feather stars *Leptometra celtica*, widely distributed aggregations of the white cluster anemone *Parazoanthus anguicomus*, with profuse development on dead coral material, and dense northern sea fans *Swiftia pallida* at a number of sites in the east of the region. Dense fan mussels *Atrina fragilis* were recorded in the deep channel (c. 80-170 m) passing through the Sound of Canna.

- Seven habitat PMFs were recorded. A tide-swept *Laminaria hyperborea* (kelp) park on mixed substrata (**IR.MIR.KR.LhypTX.Pk**) was recorded at the southern entrance to Kyle Rhea. Burrowed mud habitats with *Funiculina quadrangularis* were recorded at the southern entrance to Kyle Rhea, south of the Crowlin Islands, and off Mingulay, supporting also *Pachycerianthus multiplicatus* populations at the latter two sites (**SS.SMu.CFiMu.Spn.Meg.Fun**), as well as southeast of Tiree, where it appeared a comparatively poor example of the habitat (**SS.SMu.CFiMu.Spn.Meg**). East Scapa Flow was found to harbour fairly extensive coverage of loose-lying thalli of the red alga *Phyllophora crispa* on mixed muddy sand (**SS.SMp.KSwSS.Pcri**) with an apparently low diversity epibiotic community. Mingulay displayed extensive development of deep sponge communities with a fauna including *Swiftia pallida* and *Parazoanthus anguicomus* (**CR.HCR.DpSp**). Cold-water coral *Lophelia pertusa* reefs were recorded at three sites off Mingulay (**SS.SBR.Crl.Lop**). Tide-swept beds of horse mussels *Modiolus modiolus* (**SS.SBR.SMus.ModT**) were recorded off Noss Head and off Copinsay in the South Ronaldsay survey area. An unusually deep bed of *Modiolus*, with many of the shells deeply embedded in muddy sand, was recorded at around 120-180 m in the Sound of Canna, with affinities closest to the generally shallow, sheltered biotope, **SS.SBR.SMus.ModCvar**.
- A number of tide-swept habitats recorded in the Sound of Stroma and Kyle Rhea may be expected to undergo modification from any significant reductions in current speed associated with the development of tidal energy schemes at these locations. Such changes would not necessarily be deleterious, with possible enrichment of low-diversity habitats, especially in the Sound of Stroma.

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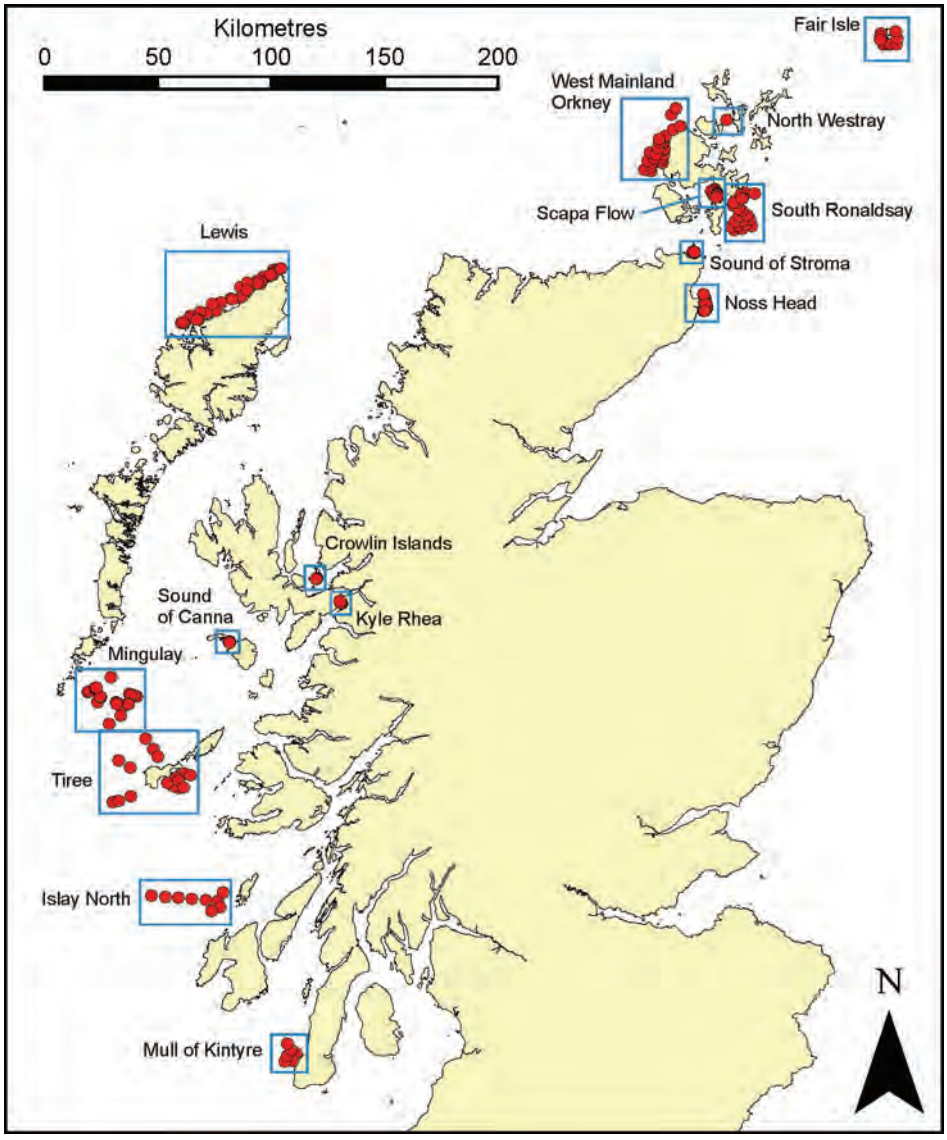
1 INTRODUCTION

The Marine (Scotland) Act 2010 provides a framework which will help balance competing demands on the maritime environment, integrating the economic growth of industry with the need to protect Scotland's seas. Where necessary, suitable conservation measures may be implemented at the wider seas level (e.g. through marine planning), targeted at specific species (e.g. improved protection for seals), or delivered within key locations (e.g. through the identification of new Marine Protected Areas - MPAs). Further details are provided in the Strategy for Marine Nature Conservation in Scotland (Marine Scotland, 2011a).

Figure 1 Distribution of survey locations (blue boxes) and sites (red circles)



To help target action under each of these three pillars, Scottish Natural Heritage (SNH) and the Joint Nature Conservation Committee (JNCC) have generated a focused list of habitats and species of importance in Scottish waters - the Priority Marine Features (PMFs) (SNH, 2011). A subset of these biological features (termed MPA search features) will drive the identification of Nature Conservation MPAs (Marine Scotland, 2011b).

The principal aim of the present investigation was to improve knowledge of the occurrence and distribution of species and habitats of recognised conservation importance in Scottish waters, especially PMFs, but also taking cognisance of other importance measures. This was to be achieved through the analysis of seabed video and still photographic imagery collected during research cruises around Scotland in 2009 and 2010. A further aim was to assess the implications of renewable energy developments on the features of importance, where they occurred in areas likely to experience such developments.

Imagery was analysed from surveys at 15 locations (Figure 1). Both video and still images were available from Marine Scotland Science surveys around Fair Isle, in Westray Firth (North Westray), west of Mainland Orkney, eastern Scapa Flow, east of South Ronaldsay, in the Sound of Stroma, off northwest Lewis, south of the Crowlin Islands, the southern region of Kyle Rhea, in the Sound of Canna, east of Mingulay, around Tiree, north of Islay and off the west coast of the Mull of Kintyre). Video footage from a 2010 survey off Noss Head by Triscom Marine (Orkney) on behalf of Aquatera Ltd (Orkney) was made available courtesy of Scottish and Southern Energy (SSE).

2 METHODS

At most locations video images were obtained from a dropdown video system deployed just above the seabed. The camera frame also carried a digital stills camera, which took vertically-orientated photographs of the seabed at intervals, and, at some locations, a laser scaling system. For the Noss Head survey an ROV was employed to record video footage only. At most sites positional data was only made available for the start and end of the run, although full tracking information was supplied for the Mingulay and Noss Head surveys. Depth readings were available at minute intervals throughout the Mingulay survey, and depths were overlaid on the Noss Head video footage. Depth data were not supplied for all the other locations and so approximate values were derived from plots of the positions of the starts and ends of runs on digital Admiralty charts. Mingulay and Noss Head depths were converted to depths below chart datum, employing TotalTide software (Admiralty, Taunton) to determine tidal rise at the nearest secondary port.

The images were used to describe the nature of the seabed, in terms of the physical structure and the species assemblages. Species present were, as far as possible, identified and quantified using the semi-quantitative MNCR SACFOR scale (Hiscock, 1996). Based on the physical and biological attributes, biotopes were allocated (Connor *et al.*, 2004). Runs traversing a sequence of biotopes were split into corresponding segments, with the transition points recorded using the video time codes, except in the case of Mingulay and Noss Head, where positional data could also be used. Segmentation of runs was not practicable in the case of mosaics of recurring biotopes, in which case all biotopes observed were simply listed.

Runs and run segments were assessed for the presence of PMFs, as well as for the presence of species and habitats of recognised conservation importance according to a number of additional criteria, including citation on the following lists: species of conservation concern (UK Biodiversity Steering Group,1995), IUCN Red List of Threatened Species (lower risk category) (IUCN, 2009), OSPAR List of Threatened and/or Declining Species and Habitats (OSPAR, 2008), UK Biodiversity Action Plan Priority Species (UKBAP, 2007) and Scottish Biodiversity List (SNH, 2010).

Species SACFOR data, habitat descriptions, biotopes, depth and positional data have been incorporated into the Marine Recorder repository (see Appendix 4).

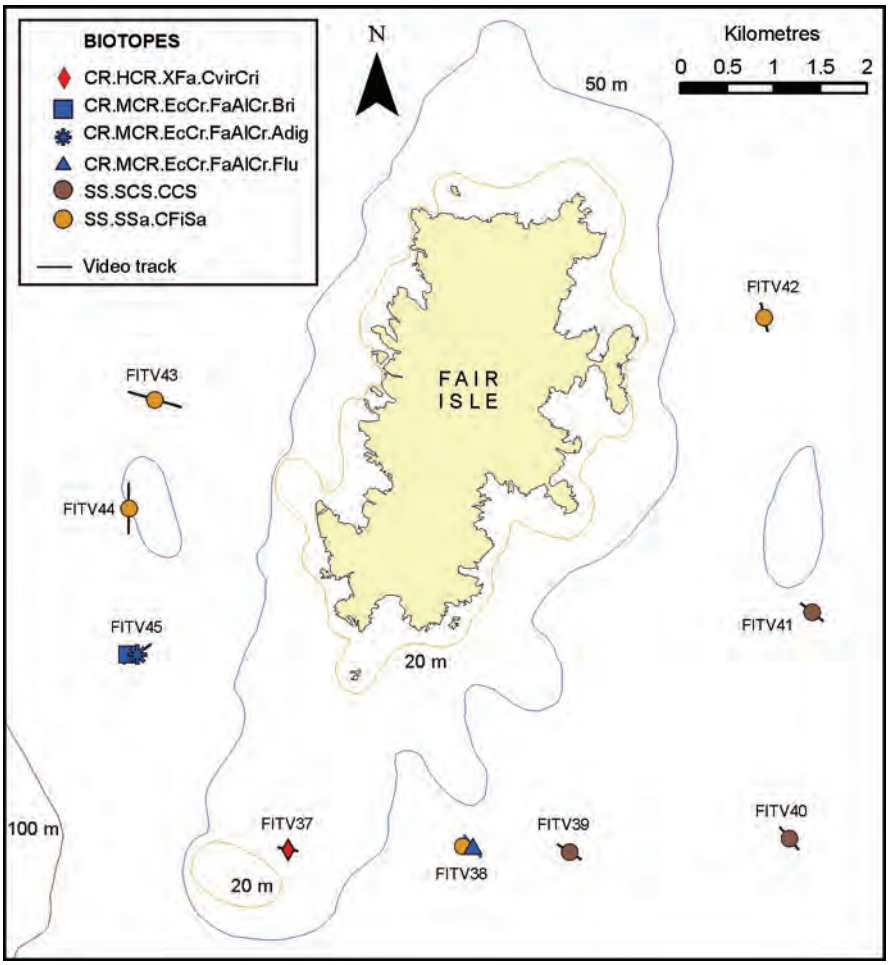
3 RESULTS

Habitat descriptions, biotopes and PMF records for the 15 locations are summarised in this section but presented in detail for each site in Appendix 2, with site location data in Appendix 1. Appendix 3 provides an inventory of the biotopes recorded, together with illustrative photographs and lists of their occurrence.

3.1 **Fair Isle** (Figure 2)

Most sites were located in deep water (51-75 m) around Fair Isle. To the west and east of the island rippled fine-medium sand sediments were recorded with the sparse evidence of life including *Alcyonidium diaphanum* and *Flustra foliacea*, much of which was probably drift material (**SS.SSa.CFiSa**). The remaining sites, located around the southern end of the island, had characteristics of current-swept habitats. Southeast of the island heterogeneous coarse gravelly sediments supported a low-diversity epifauna but profuse development of *A. diaphanum*, including many very large colonies up to 50 cm in length (**SS.SCS.CCS**).

Figure 2 Distribution of biotope records around Fair Isle



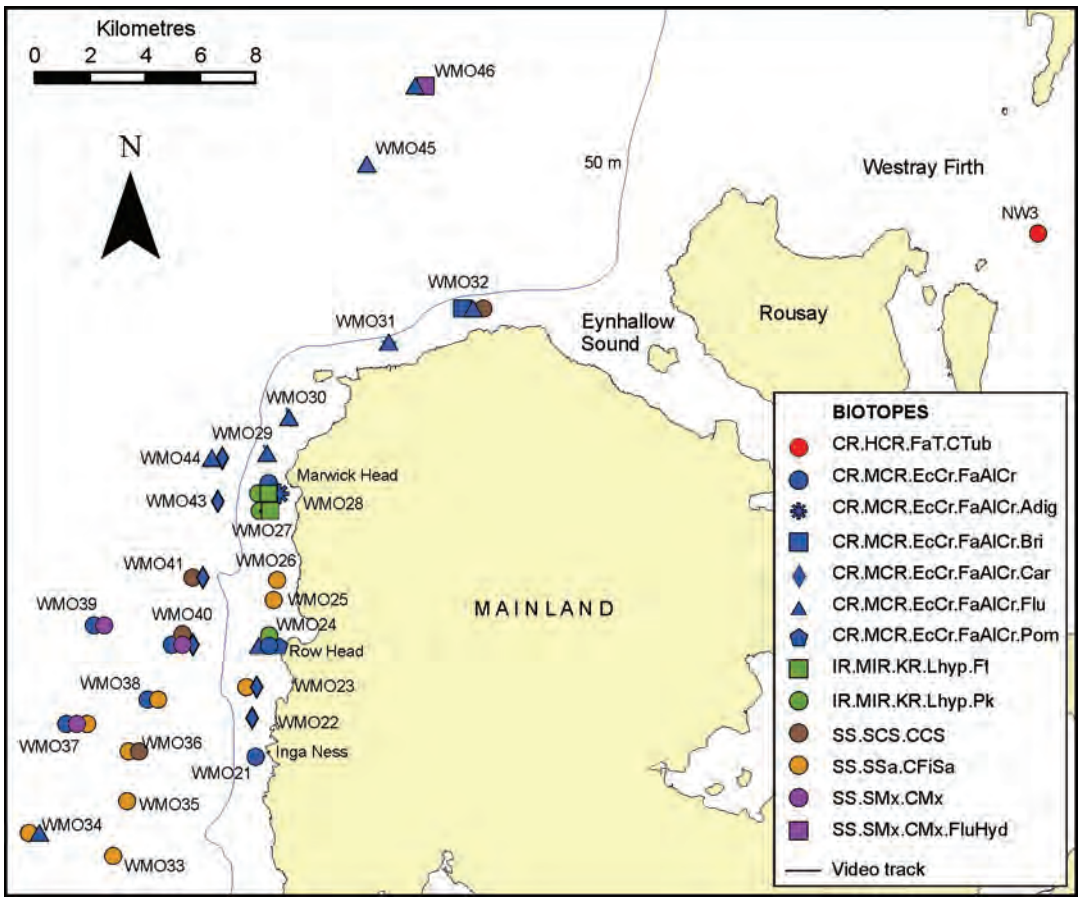
Rock was also recorded off the south of the island in the form of sand-scoured bedrock, and cobbles and boulders on medium-coarse sand. The bedrock supported a low-diversity community dominated by the erect bryozoans, *A. diaphanum* and *F. foliacea*, and including serpulid and bryozoan crusts (**CR.MCR.EcCr.FaAlCr.Flu**), but with much of the rock covered by rippled fine-medium sand (**SS.SSa.CFiSa**). Cobbles and boulders supported

dense *Spirobranchus* spp. and *Alcyonium digitatum* (**CR.MCR.EcCr.FaAlCr**), and locally abundant *Ophiocomina nigra* (**CR.MCR.EcCr.FaAlCr**). One site was located at around 30 m on a shallow tongue extending southwards from the island, where the substrate consisted of bedrock and boulders on shell gravel. The biota was dominated by dense carpets of *Corynactis viridis* and *Alcyonium digitatum*, with sparse sponges such as *Myxilla incrustans* and also the scleractinian *Caryophyllia smithii* (**CR.HCR.XFa.CvirCri**). No PMFs were recorded.

3.2 West Mainland Orkney (Figure 3)

A string of sites were located close inshore, within the 50 m contour, between Inga Ness and Eynhallow Sound. South of Marwick Head a mix of rock and sedimentary habitats was encountered, with extensive areas of stepped bedrock ledges and platforms off Marwick Head and Row Head. Circalittoral rock here supported a fairly sparse encrusting community of coralline algae, serpulid worms and bryozoans (**CR.MCR.EcCr.FaAlCr**), although vertical walls, some extensive, supported dense fields of *Alcyonium digitatum* (**CR.MCR.EcCr.FaAlCr.Adig**) Gulleys and other sand-influenced areas were characterised by dense *Flustra foliacea* (**CR.MCR.EcCr.FaAlCr.Flu**). Where the camera tracked into the infralittoral (probably between around 20-30 m), forests (**IR.MIR.KR.Lhyp.Ft**) and parks (**IR.MIR.KR.Lhyp.Pk**) of *Laminaria hyperborea* were present, with an understorey of moderate densities of red algae and *Dictyota dichotoma*.

Figure 3 Distribution of biotopes west of Mainland and at North Westray, Orkney



Extensive areas of sediment in the form of rippled fine sand with little surface evidence of life (**SS.SSa.CFiSa**) were recorded between Marwick Head and Row Head, whilst south of Row

Head the seabed was more mixed with areas of sand (**SS.SSa.CFiSa**), boulders and cobbles on sand and outcropping bedrock, with rock surfaces displaying an algal, bryozoan and serpulid encrusting community (**CR.MCR.EcCr.FaAlCr**), supplemented by high densities of *Caryophyllia smithii* in places (**CR.MCR.EcCr.FaAlCr.Car**). Inshore sites to the north of Marwick Head generally displayed a seabed of sand-scoured, low-profile bedrock and boulders, with patches of sand. The predominantly rock-encrusting community here was augmented with bryozoan turfs, especially *Flustra foliacea* (**CR.MCR.EcCr.FaAlCr.Flu**).

Sandy sediments or mixed stony sand substrates predominated beyond the 50 m contour. South of Row Head sediments were mostly composed of fine sand, with evidence of the infaunal community including faecal mounds, polychaete casts, bivalve siphons and emergent *Antalis entalis* shells, as well as the possible presence of small burrows, *Lanice conchilega* tubes and sandeels *Ammodytes* sp. (**SS.SSa.CFiSa**). To the north of Row Head coarse sands, locally in the form of waves, were accompanied by varying proportions of gravel, pebbles, cobbles and boulders, with local concentrations of boulders and cobbles. Homogeneous coarse sand showed no evidence of infaunal life (**SS.SCS.CCS**). Areas of scattered cobbles, pebbles and gravel on sand supported a sparse fauna of encrusting serpulid worms and bryozoans on the larger stones (**SS.SMx.CMx**), supplemented regionally by sparse hydroids and *Flustra foliacea* (**SS.SMx.CMx.FluHyd**). Boulder and cobble patches displayed a serpulid and bryozoan encrusting community but accompanied in places by dense *Caryophyllia smithii* (**CR.MCR.EcCr.FaAlCr.Car**) or with patches of *Flustra foliacea* and *Securiflustra securifrons* (**CR.MCR.EcCr.FaAlCr.Flu**).

The only indication of the presence of PMFs in this area was the possible sighting of a small shoal of *Ammodytes* sp., disturbed by the camera flash over fine sand in c. 66 m.

3.3 North Westray (Figure 3)

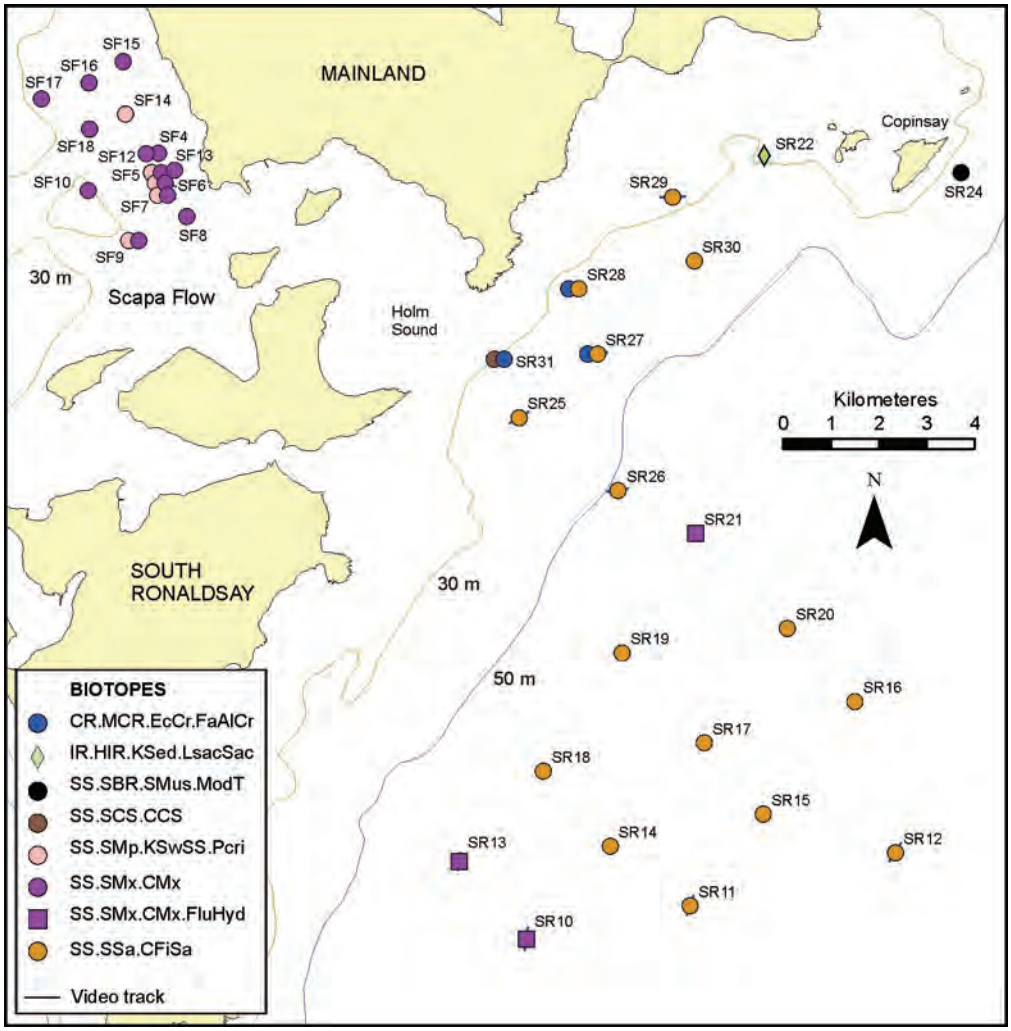
The single site at this location was in an area of rapid currents (c. 5 kt) in Westray Firth at a depth of around 39 m. The substrate consisted of dense boulders and cobbles with a shell gravel infill and small patches of coarse sediment and outcropping bedrock. The rock supported a low-diversity community dominated by crusts of barnacles (probably *Balanus crenatus*), coralline algae and red bryozoans, with patches of *Tubularia indivisa*, encrusting and cushion sponges, *Alcyonium digitatum* and *Flustra foliacea*. The biotope has been referred to **CR.HCR.FaT.CTub**, although the density of *Tubularia* is atypically low. Neither the habitat, nor any of the recorded members of the community, is a PMF.

3.4 South Ronaldsay (Figure 4)

Most of the sites were located in deep water (50-74 m) off the east of Ronaldsay, where the seabed was largely composed of rippled fine sand. There were few signs of infaunal life and the epifaunal community was sparse, consisting largely of widely scattered echinoderms, including *Asterias rubens*, *Luidia ciliaris* and *Crossaster papposus* (**SS.SSa.CFiSa**). Locally, particularly towards the southern tip of Ronaldsay, the sediment became more mixed, with the addition of shell and scattered stones, as well as small rock outcrops, providing a substrate for sparse clumps of hydroids and *Flustra foliacea* (**SS.SMx.CMx.FluHyd**). Rippled fine sand was also recorded in shallower waters (26-42 m) to the east of Holm Sound but here an infaunal component was more conspicuous, with the presence of mounds, siphons, terebellid tentacles, sabellid crowns, *Lanice conchilega*? and *Cerianthus lloydii* (**SS.SSa.CFiSa**). Rock substrates were also present here in the form of bedrock outcrops and stone bands (boulders, cobbles, pebbles and gravel) supporting a low-diversity encrusting community of serpulid worms, bryozoans and, at the shallower sites, coralline algae, and dense *Echinus esculentus* (**CR.MCR.EcCr.FaAlCr**). At the entrance to Holm Sound the rock also supported fairly dense populations of *Ophiothrix fragilis* and

Ophiocomina nigra. Also present here were waves of shelly medium sand with little evidence of life (**SS.SCS.CCS**), close to a charted region of tidal rips. To the west of Copinsay sand-scoured bedrock and boulders supported the scour-tolerant kelps, *Saccorhiza polyschides* and *Saccharina latissima*, with an understorey of faunal and algal crusts, *Alcyonium digitatum* and *Ophiura albida* (**IR.HIR.KSed.LsacSac**). The site of greatest conservation interest in this area lay to the east of Copinsay, where a virtually continuous sheet of superabundant *Modiolus modiolus* lay on a mixed substrate of sand, gravel, pebbles and shells (**SS.SBR.SMus.ModT**). The mussels supported superabundant *Ophiothrix fragilis* and high numbers of large *Asterias rubens* and *Echinus esculentus*. This was the only certain PMF identified in the area, apart from a possible sighting of small numbers of *Ammodytes* sp. in the rippled fine sand habitat.

Figure 4 Distribution of biotopes off South Ronaldsay and in Scapa Flow



3.5 **Scapa Flow** (Figure 4)

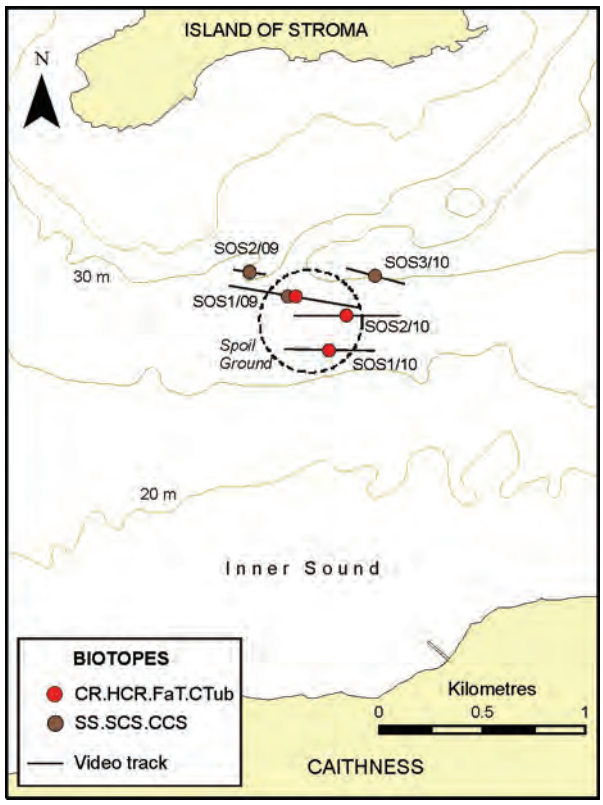
The sites were located at depths of 20-30 m on a heterogeneous seabed of muddy sand with an admixture of gravel, pebbles and shell material, together with scattered cobbles and boulders in places. At many sites the sediment was covered with a flocculent brown surface layer, probably diatomaceous, which locally had settled to form a film. The principal indication of the infaunal community took the form of numerous mounds 5-25 cm in diameter, whilst the epifauna was dominated by *Asterias rubens* and *Liocarcinus depurator*, with stones and shells encrusted with serpulid worms (**SS.SMx.CMx**). Patches of free-living

Phyllophora crispa were present at most of the sites but this red alga became abundant or superabundant at several of the shallower sites (<25 m). This biotope, **SS.SMp.KSwSS.Pcri**, is a PMF. *Modiolus modiolus* was also present at one site, but not in sufficient density to constitute a *Modiolus* bed.

3.6 **Sound of Stroma** (Figure 5)

The sites were located in the Inner Sound, south of the Island of Stroma in an area of strong currents (c. 5 kt) at depths of 29-32 m, with the runs passing through or around a spoil ground. The seabed consisted of uneven, fissured bedrock with boulders collecting in gulleys and lows. There were also extensive areas of shell gravel and coarse sand, with coarse material also collecting in rock fissures and lows. Rock adjacent to major sediment pockets was observed to be polished smooth by the scour. Over most of the area the rock was dominated by a crust of *Balanus crenatus* (although mostly dead in places) and abundant *Urticina felina*. The barnacles will act as a food source for the locally abundant young *Cancer pagurus* and sparse *Nucella lapillus*. At some sites there was extensive coverage of the rock by a yellow encrusting sponge, with lesser quantities of other sponges, such as *Esperiopsis fucorum* and *Hymedesmia paupertas*?, and a patchy bryozoan turf. Apparently sparse members of the community included polyclinid cushions, *Alcyonium digitatum* and hydroid patches. The biotope has been referred to **CR.HCR.FaT.CTub**, although the characterising species, *Tubularia indivisa*, appeared to be only present at low density. Areas of coarse sediment are presumably highly mobile and showed no evidence of life (**SS.SCS.CCS**). No PMFs were recorded at this location.

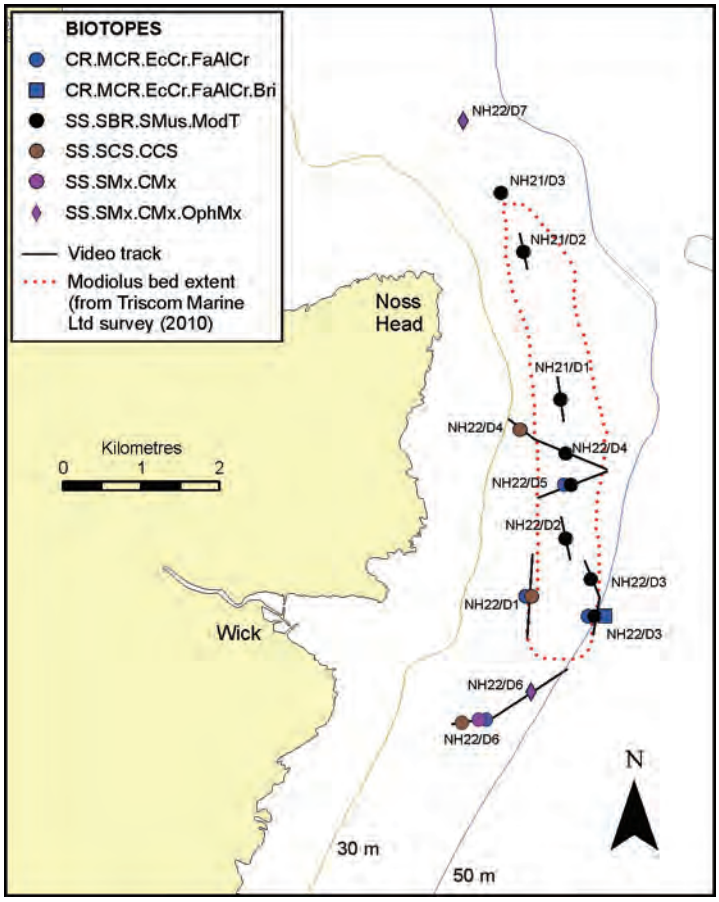
Figure 5 Distribution of biotopes in the Sound of Stroma



3.7 **Noss Head** (Figure 6)

The survey sites were located within a coastal band extending from around 30 m to 50 m in depth. No photographs were available for this location and the quality of the video was very poor, as a result of the high drift speeds. This led to poor discriminatory ability for the biota and substrates. Shell gravel/coarse sand, sometimes in the form of waves, floored the seabed to a depth of around 40 m. A sparse visible biota included occasional *Asterias rubens* (**SS.SCS.CCS**). Beyond 40 m there appeared to be a transition to a coarse mixed sediment with scattered cobbles and boulders, with outcropping low-profile, laminar bedrock towards the south of the area. The dominant biological feature was the almost continuous sheet of *Modiolus modiolus* over much of the area (**SS.SBR.SMus.ModT**). This PMF extended for a distance of c. 5.7 km, attaining a width of around 0.8 km. It was not possible to discriminate between live material and dead shells, but the high numbers of *Asterias rubens* were suggestive of a significant live component. The fauna also included abundant *Echinus esculentus*, a patchy hydroid turf, and dense patches of brittlestars, which may have been far more extensive over the area than could be discerned on the video. Boulder patches were of fairly bare appearance but supported serpulid worms, locally dense *E. esculentus*, and possibly sparse *Alcyonium digitatum* (**CR.MCR.EcCr.FaAlCr**), with dense brittlestars towards the south of the band (**CR.MCR.EcCr.FaAlCr.Bri**). Dense brittlestar beds on apparently mixed coarse sediment were also recorded to the north and south of the mussel band (**SS.SMx.CMx.OphMx**). This interpretation of the mussel distribution at this location is broadly consistent with the findings of Triscom Marine (2010).

Figure 6 Distribution of biotopes off Noss Head

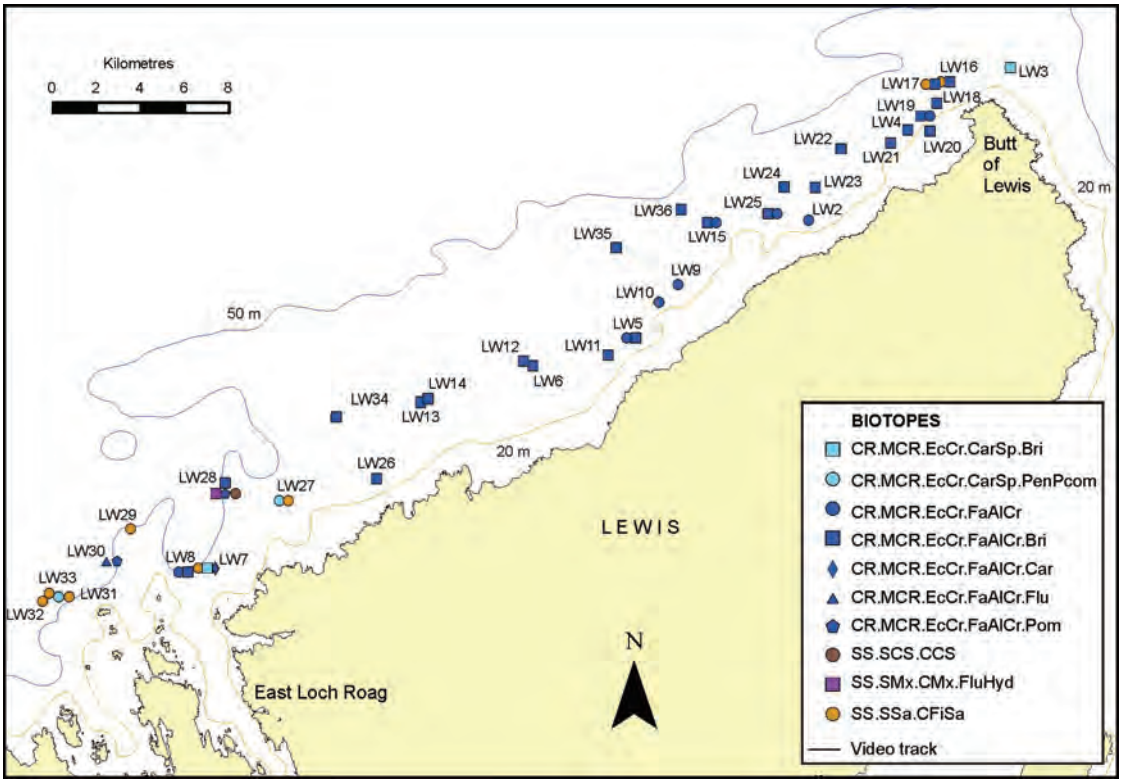


3.8 **Lewis** (Figure 7)

Most of the surveyed area lies between East Loch Roag and the Butt of Lewis at depths of 20-50 m. The seabed was principally composed of uneven bedrock and patches of boulders and cobbles on medium-coarse sand. The substrate generally supported a low-diversity community, with crusts of coralline algae, *Parasmittina trispinosa* and *Spirobranchus* spp. coating the rock, which will be heavily grazed by the high numbers of *Echinus esculentus* (**CR.MCR.EcCr.FaAlCr**). At most sites the community was supplemented by abundant or superabundant brittlestars, with either *Ophiothrix fragilis* or *Ophiocomina nigra* dominating locally (**CR.MCR.EcCr.FaAlCr.Bri**). The area is more exposed than is typical for such crust biotopes and this was reflected in the presence of an, albeit sparse, sponge fauna at some sites, including massive forms, such as *Cliona celata* and *Pachymatisma johnstonia*. Elevated tidal streams around the Butt of Lewis resulted in the profuse development of cushions of *Corynactis viridis*, as well as dense *Alcyonium digitatum* and brittlestars coating the rock (**CR.MCR.EcCr.CarSp.Bri**). There is an intrusion of deeper water off East Loch Roag, with most of the sites at this end of the surveyed area located around or beyond the 50 m contour. Sediment substrates were more prevalent here, mostly in the form of rippled fine-medium sand or waves of medium sand, which exhibited little visual evidence of life (**SS.SSa.CFiSa**). Bedrock outcrops and areas of boulders and cobbles on sand supported a crust community, but this was enriched in places by dense *Caryophyllia smithii*, erect bryozoans including *Porella compressa*, *Pentapora fascialis* and *Flustra foliacea*, *Corynactis viridis* and a relatively diverse sponge fauna (**CR.MCR.EcCr.CarSp.PenPcom** and **CR.MCR.EcCr.CarSp.Bri**).

None of the habitats recorded in this area are PMFs. However, ling (*Molva molva*), a mobile species PMF, was occasionally observed amongst the rocks off the Butt of Lewis.

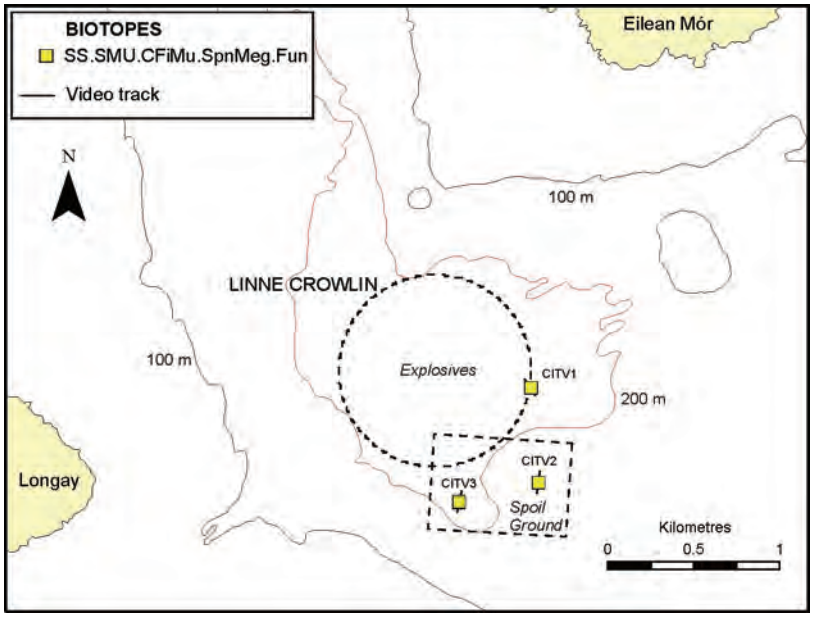
Figure 7 Distribution of biotopes off Lewis



3.9 **Crowlin Islands** (Figure 8)

The three video runs were located within a deep basin to the south of the Crowlin Islands at depths of 180-210 m. The camera tracked through the edge of a disused explosives dumping ground and a spoil ground. The substrate of soft mud was densely perforated by c. 1.5 cm diameter vertical burrows, smaller burrows and sparse *Nephrops norvegicus* burrows. *Funiculina quadrangularis* was locally common and supported occasional *Asteronyx loveni*, and dense *Pachycerianthus multiplicatus* occurred at two of the sites (**SS.SMu.CFiMu.Spn.Meg.Fun**). The burrowed mud habitat and its component species, *F. quadrangularis* and *P. multiplicatus*, are all PMFs.

Figure 8 Distribution of biotopes off the Crowlin Islands

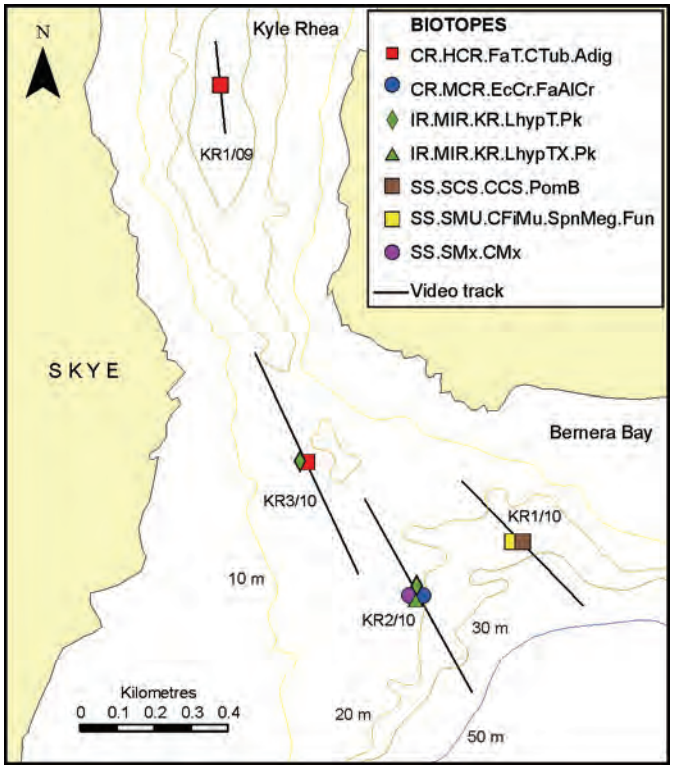


3.10 **Kyle Rhea** (Figure 9)

Video runs located in the most tide-swept areas within Kyle Rhea and at the southern entrance traversed areas of uneven bedrock and boulders and cobbles. The rock supported dense *Alcyonium digitatum* and extensive coverage by yellow sponges, which included *Myxilla incrustans*, sparse *Pachymatisma johnstonia* and hydroid patches including *Tubularia indivisa* (**CR.HCR.FaT.CTub.Adig**). At the shallow (12-17 m) southern entrance site, KR3/10, the community was supplemented by a red algal turf, locally superabundant, and a short hydroid/bryozoan turf, with frequent *Laminaria hyperborea* locally (**IR.MIR.KR.LhypT.Pk**). The more southerly runs spanned broad depth and current ranges. At KR2/10 a tide-swept *Laminaria hyperborea* park with dense *A. digitatum* and a patchy turf of *Tubularia indivisa* and other hydroids on boulders and cobbles on shell gravel (**IR.MIR.KR.LhypTX.Pk**), with areas of bedrock outcrops (**IR.MIR.KR.LhypT.Pk**), gave way to a heterogeneous habitat of coarse gravelly sand with stones. The community associated with the mixed substrate appeared impoverished, with sparse encrustations of orange bryozoans and coralline algae on cobbles and boulders, together with hydroid patches and *Caryophyllia smithii* (**SS.SMx.CMx** and **CR.MCR.EcCr.FaAlCr**). At site KR1/10 the run traversed a slope from 17 m to around 40 m. At the shallower end a tide-swept heterogeneous coarse substrate of shelly sand with gravel and stones supported an impoverished community of encrusting serpulid worms and coralline algae, with sparse algal tufts on the larger stones (**SS.SCS.CCS.PomB**). With movement down the slope the sediment changed to muddy sand supporting a richer community. *Funiculina quadrangularis*

became abundant over a wide area and was accompanied by sparse *Pennatula phosphorea*. The sediment was punctured by mostly small burrows, some occupied by *Munida sarsi*, with occasional *Nephrops*-like burrows (**SS.SMu.CFiMu.Spn.Meg.Fun**). This burrowed mud habitat and the associated *F. quadrangularis* represent PMFs.

Figure 9 Distribution of biotopes in the south of Kyle Rhea

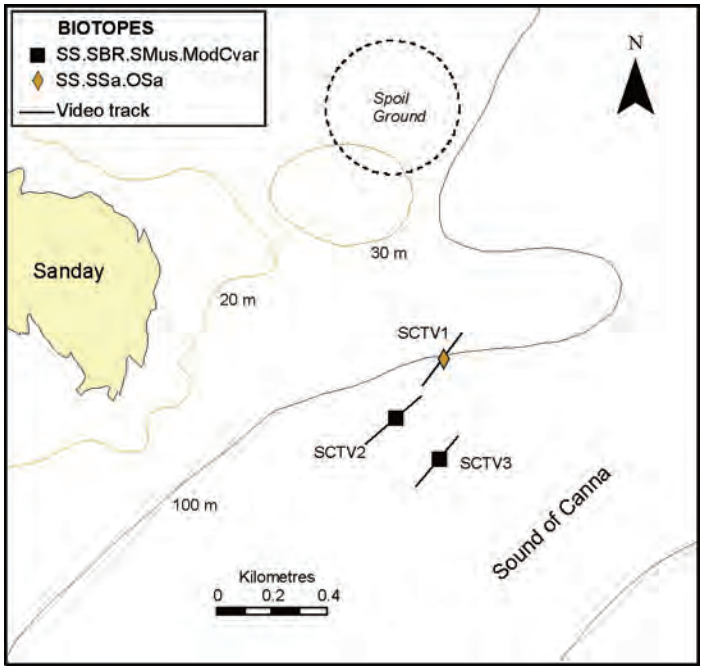


3.11 **Sound of Canna** (Figure 10)

The sites were located along the western edge of the deep channel passing through the Sound of Canna at depths of around 80-180 m. At the shallowest site, SCTV1 (80-110 m), a substrate of muddy sand with scattered gravel, pebbles, cobbles and small boulders supported dense *Atrina fragilis*. Overall density of the species was estimated as c. 1/m^2 but it surpassed this during the first half of the run. The shells provided a substrate for an associated fauna, apparently dominated by hydroids such as *Nemertesia ramosa* and *Halecium halecinum*?, but identifications were problematic due to the lack of photographic coverage at this site. Other members of the fauna included *Sabella pavonina*?, *Ophiocomina nigra* and *Ophiothrix fragilis*, with evidence of the infaunal community comprising many small holes in the sediment, some housing bivalve siphons, and holothurian tentacle crowns (**SS.SSa.OSa**). Site SCTV2 was more or less contiguous with the previous site but ran into deeper water (170 m). The substrate of muddy sand with broken and whole shell material supported a *Modiolus modiolus* bed, consisting of clumps of abundant mussels, mostly or completely buried, with just the posterior shell tip and mantle edge visible at the sediment surface. The shells supported an associated fauna dominated by hydroids and sponges, including *N. ramosa*, *H. halecinum*? and *Iophon hyndmani*?, terebellid worms and *O. nigra*. The infauna included frequent *A. fragilis*, as well as *Myxicola infundibulum* and holothurians, whilst the epifauna included *S. pavonina*?, *Alcyonium digitatum*, *Hippasteria phrygiana* and frequent hake, *Merluccius merluccius*. This deep, probably moderately tide-swept, fine sediment habitat, dominated by infaunal and semi-infaunal *Modiolus*, is not readily ascribable to existing *Modiolus* bed biotopes but has

strongest affinities with **SS.SBR.SMus.ModCvar**. The biotope was also recorded at the third site, SCTV3, at 160-180 m on a similar substrate, apart from the addition of cobbles and boulders. No distinct *Modiolus* clumps were discernible in the latter half of this run, although buried individual mussels appeared to be present between the stones. Sparse *A. fragilis* was also present at this site. In terms of PMF representation, this important location supports a dense population of the rare *A. fragilis* and an atypical form of *Modiolus* bed.

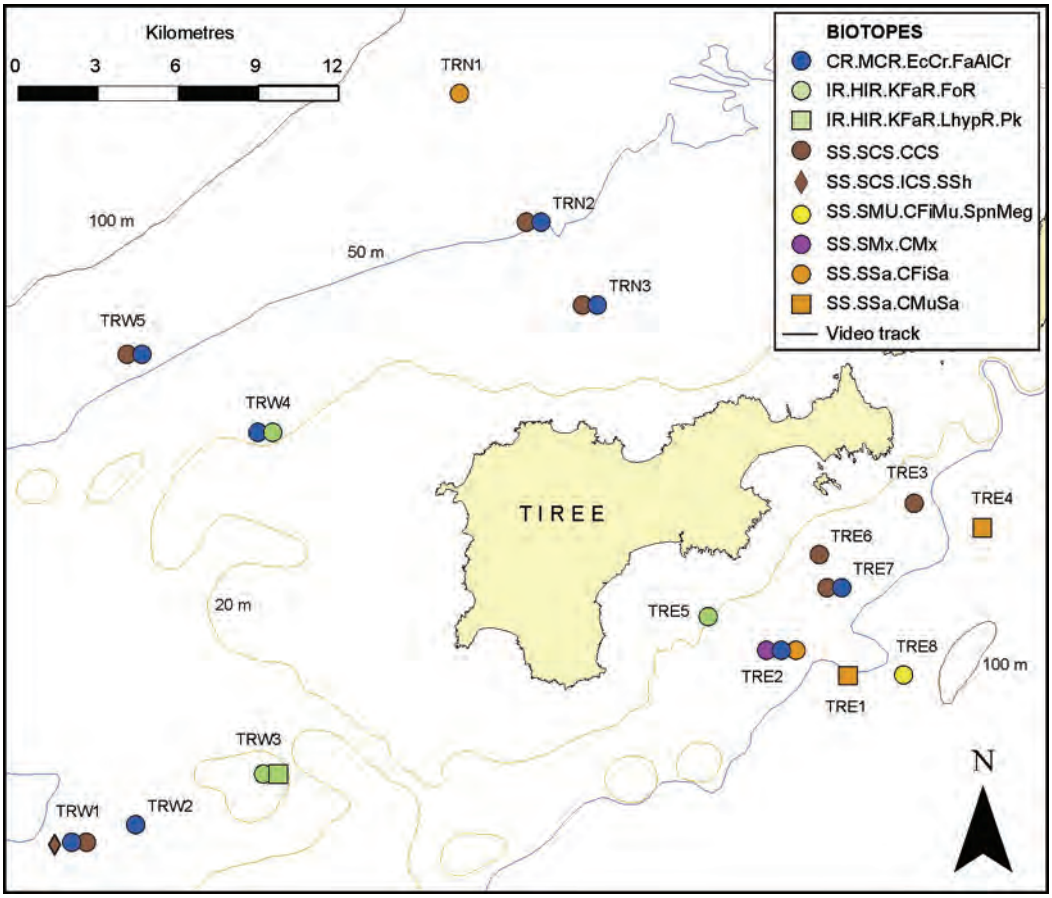
Figure 10 Distribution of biotopes in the Sound of Canna



3.12 **Tiree** (Figure 11)

To the north and west of Tiree the substrates recorded below 25 m were largely coarse sands or shell gravel, with varying concentrations of pebbles, cobbles and boulders. The larger stones were encrusted with *Spirobranchus* spp., *Parasmittina trispinosa*, and in shallower water coralline algae, and supported a sparse sessile fauna including hydroid patches, *Caryophyllia smithii*, *Porella compressa* and the sponges, *Cliona celata* and *Axinella infundibulum*?. Areas exhibiting concentrations of boulders and cobbles have been referred to **CR.MCR.EcCr.FaAlCr**. There was little evidence of life in the coarse sediments apart from sparse *Lanice conchilega* and *Chaetopterus variopedatus* (**SS.SCS.CCS**). One area of rounded pebbles at site TRW1 appeared virtually barren, apart from the presence of *Ophiura albida* (**SS.SCS.ICS.SSh**). The deepest site surveyed at 76 m (TRN1) exhibited finer sediment than elsewhere, in the form of fine-medium sand with few visible signs of infaunal life (**SS.SSa.CFiSa**). Bedrock was encountered in shallow waters at 20-25 m, which appears to represent the infra/circalittoral boundary. A park of small *Laminaria hyperborea* plants extended to around 20 m with an understorey dominated by red algae, very dense in places, and a faunal component including *Sagartia elegans* and *Alcyonium digitatum* (**IR.HIR.KFaR.LhypR.Pk**). This understorey community continued below the lower kelp park boundary (**IR.HIR.KFaR.FoR**).

Figure 11 Distribution of biotopes around Tiree



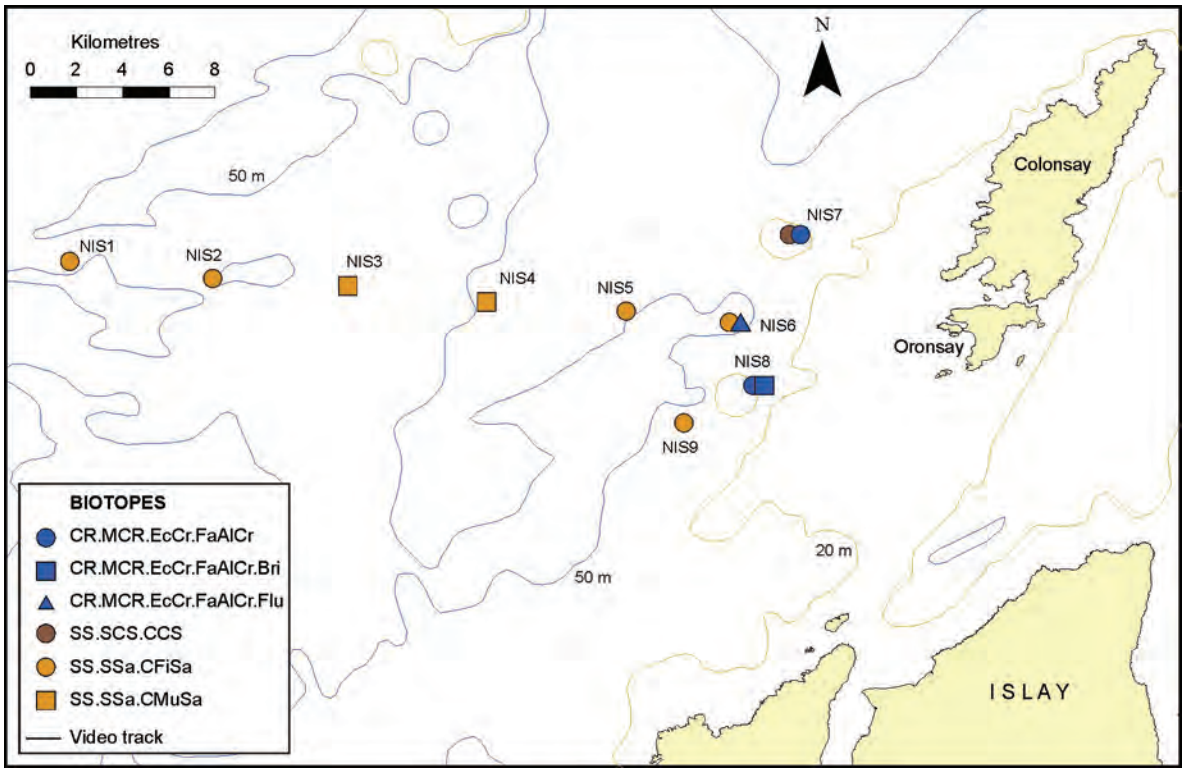
To the southeast of Tiree survey sites were located on a gradation of sediment types from coarse sand and gravels at 20-34 m, through medium sand at 47 m, to muddy sand at 53-60 m and soft mud at 96 m. Coarse sediments were populated by sparse *Luidia ciliaris* and *Asterias rubens*, with scattered shells and stones supporting an encrusting community, with sparse hydroids and *Alcyonium digitatum* (**SS.SCS.CCS**). Dense cobbles and boulders at site TRE5 (20 m) provided a substrate for a rich red algal turf, with the more conspicuous elements including *Delesseria sanguinea*, *Plocamium cartilagineum* and *Dilsea carnosa* (**IR.HIR.KFaR.FoR**), whilst at the slightly deeper site, TRE7 (29 m), boulders and cobbles supported an encrusting fauna dominated by *Spirobranchus* spp. and *Parasmittina trispinosa*, as well as occasional *Caryophyllia smithii* and patches of erect bryozoans, which appeared to include *Securiflustra securifrons*, *Porella compressa* and *Pentapora fascialis* (**CR.MCR.EcCr.FaAlCr**). This biotope was also recorded in deeper water at TRE2 (46 m), together with areas of coarse mixed sediment (**SS.SMx.CMx**) and medium sand waves (**SS.SSa.CFiSa**) with sparse evidence of life. Farther offshore, muddy sand hosted terebellid worms and a sparse epifauna of *Luidia ciliaris*, *Munida sarsi* and *Pecten maximus* (**SS.SSa.CMuSa**), whilst at 96 m soft mud was perforated by abundant small burrows around 1 cm in diameter and occasional small, *Nephrops*-like burrows, with small *Nephrops* being observed. No seapens were recorded, but visibility was very poor (**SS.SMu.CFiMu.SpnMeg**). This is the only record of a PMF at this location.

3.13 **Islay North** (Figure 12)

Most of the sites are located along a transect running west from the Island of Oronsay and are largely at depths of 50-55 m. The predominant substrate was rippled fine sand, with

some enhancement of the silt content producing slightly muddy sands locally. Evidence of infaunal life included the presence of polychaete casts, bivalve siphons and *Amphiura* spp. arms, whilst the epifaunal community included *Corystes cassivelaunus* and locally dense *Corymorpha*-like forms. Areas of cleaner fine sand (**SS.SSa.CFiSa**) apparently supported a more impoverished community than the siltier sediments (**SS.SSa.CMuSa**). At one site cobbles and boulders were present on the sand and exhibited a fauna of encrusting bryozoans and sparse *Alcyonium digitatum* and *Flustra foliacea* (**CR.MCR.EcCr.FaAlCr.Flu**). At the shallowest sites close to Oronsay (22-30 m) waves of silty shell gravel (**SS.SCS.CCS**) and areas of bedrock and boulders were recorded, supporting encrustations of *Spirobranchus* spp., orange bryozoans and coralline algae, as well as sparse *Alcyonium digitatum* and *Cliona celata* (**CR.MCR.EcCr.FaAlCr**). The fauna was augmented by dense *Ophiocomina nigra* at one of the sites (**CR.MCR.EcCr.FaAlCr.Bri**). No PMFs were recorded here.

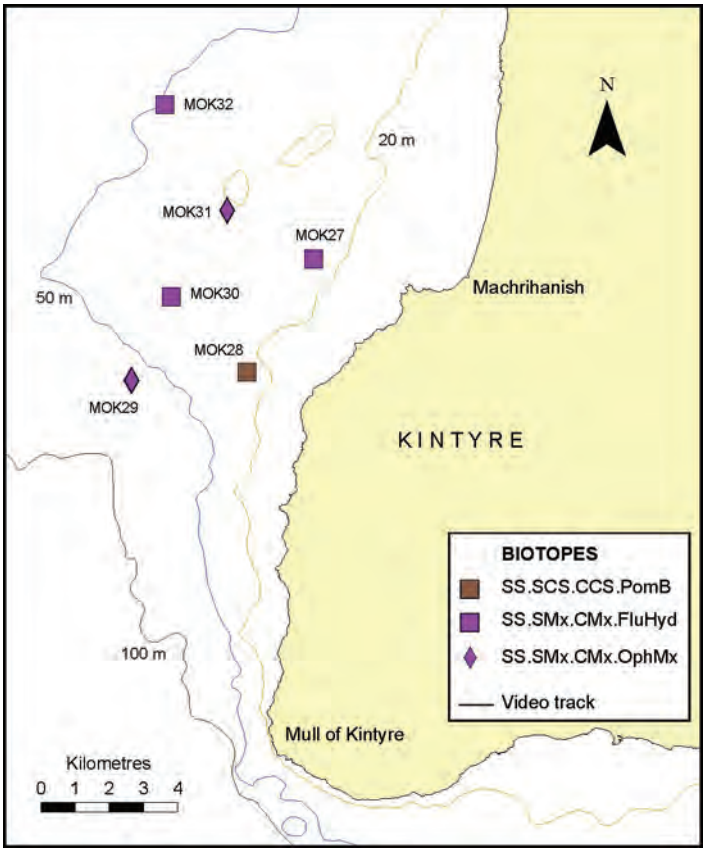
Figure 12 Distribution of biotopes off NW Islay



3.14 **Mull of Kintyre** (Figure 13)

The seabed in the survey area off Machrihanish ranged from 21 to 58 m and consisted largely of heterogeneous substrates of pebbles and gravel, with varying concentrations of scattered cobbles and boulders, in places on a bed of sand. Pebbles and larger stones were encrusted with *Spirobranchus* spp. and other serpulids, *Parasmittina trispinosa* and other bryozoans, and coralline algae at the shallower sites. At site MOK28 additional members of the sessile community were very sparse (**SS.SCS.CCS.PomB**), but at most sites the fauna included patches of erect bryozoans (*Flustra foliacea*, *Securiflustra securifrons*, *Eucratea loricata*?, *Pentapora fascialis*) and hydroids, such as *Nemertesia ramosa*, *Abietinaria abietina*? and *Halecium halecinum*?. A sparse sponge fauna included *Polymastia boletiformis* and *Myxilla incrustans*?. These sites have been assigned the biotope **SS.SMx.CMx.FluHyd**, except where there was also the presence of abundant *Ophiocomina nigra* and/or *Ophiothrix fragilis* (**SS.SMx.CMx.OphMx**). No PMFs were recorded here.

Figure 13 Distribution of biotopes off Kintyre



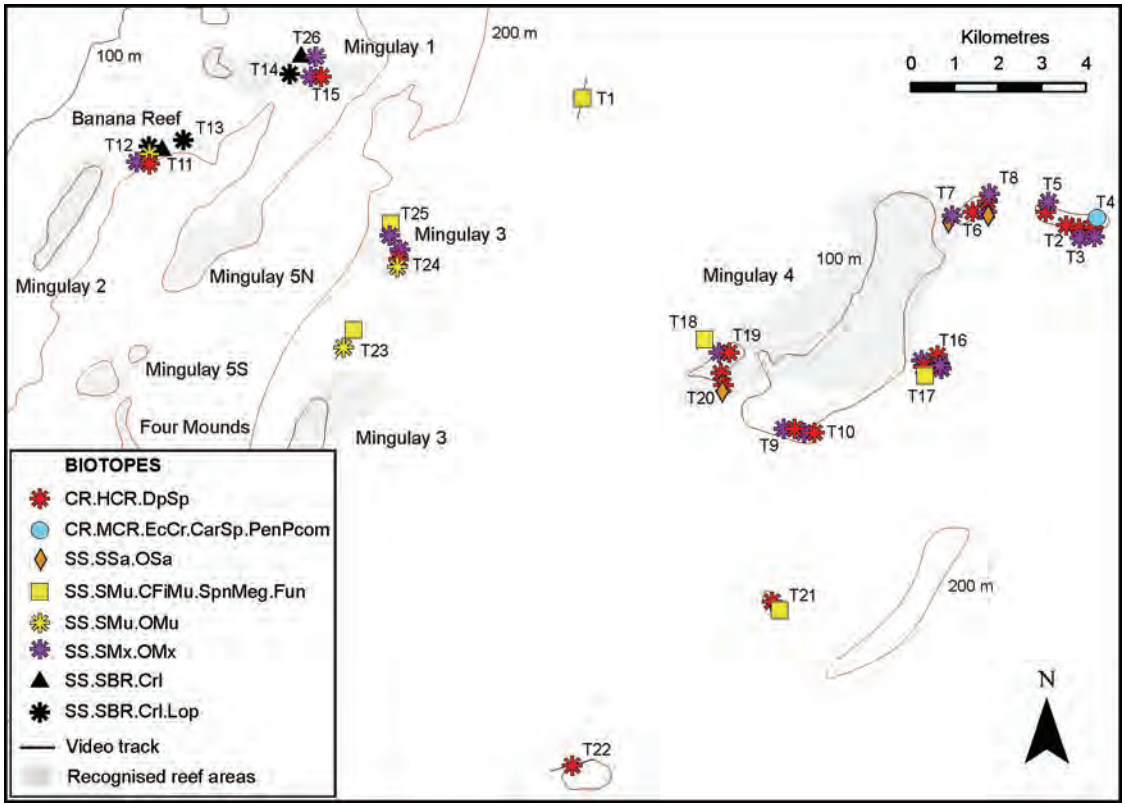
3.15 **Mingulay** (Figure 14)

To place the sites into a geographical context, their positions are shown in relation to the known rock and/or coral reef habitat areas in this region recognised by previous workers (e.g. Davies *et al.*, 2009) and shown in Figure 14. The 26 video transect runs displayed habitats that have been classified as eight biotopes. The predominant habitat, occurring at 17 of the sites at depths of 46-156 m, was bedrock or dense fields of cobbles and boulders. The rock generally supported a diverse community dominated by *Axinella infundibularis* and/or *Phakellia ventilabrum* (**CR.HCR.DpSp**). Flatter areas of rock supported a more impoverished fauna, although small colonies of *Swiftia pallida* occurred in high density at such locations and were widespread in the eastern part of the surveyed area. A rich bryozoan fauna included *Porella compressa*, *Reteporella beaniana*, *Omalosecosa ramulosa* and *Caberia ellisii*, with other conspicuous sessile forms including *Diazona violacea* and *Filograna implexa* aggregations. *Parazoanthus anguicomus* was widely recorded in this habitat, although generally at low density. At the shallowest site east of Mingulay 4 this deep sponge community gave way to dense *Corynactis viridis* and *Caryophyllia smithii* between 34-61 m (**CR.MCR.EcCr.CarSp.PenPcom**).

Lophelia pertusa was observed at three sites at 124-149 m, two on Banana Reef and one in the Mingulay 1 area. The habitat consisted largely of coral rubble with an infill of muddy sediment and occasional erect coral frameworks composed of both dead and living material (**SS.SBR.CrI.Lop**). The reef material provided a habitat for abundant *Parazoanthus anguicomus* and large numbers of sabellid worms. Areas of just dead erect coral structures and broken rubble with a similar conspicuous associated fauna were also recorded in the same vicinity, and have been referred to **SS.SBR.CrI**.

Heterogeneous substrates of scattered cobbles and boulders on muddy sediment, often with a high gravel component, were widely distributed throughout the survey area, being recorded at 15 sites at depths of 75-166 m. These generally supported extensive, dense fields of *Leptometra celtica*, together with occasional *Pachycerianthus multiplicatus* and a sessile rock community similar to, but less rich than, that found in reef areas (**SS.SMx.OMx**). A more homogeneous sediment of slightly muddy sand, rippled in places and bearing sparsely scattered cobbles and boulders in others was recorded at 3 sites at 101-109 m. This supported sparse *Pennatula phosphorea* and small burrows (**SS.SSa.OSa**). In deeper water (112-183 m) muds were recorded. At three sites the sediment was only perforated by small burrows, with *Pachycerianthus multiplicatus* present but no sea pens observed (**SS.SSa.OMu**). At six sites, widely distributed over the survey region between the known reef areas, the mud supported *Funiculina quadrangularis* at moderate to high densities, and generally dense small burrows together with fairly sparse *Nephrops* burrows (**SS.SMu.CFiMu.SpnMeg.Fun**). At some of these sites *P. multiplicatus* and dense patches of *L. celtica* were observed.

Figure 14 Distribution of biotopes to the east of Mingulay



The survey area displayed a rich assemblage of PMFs in terms of both diversity and frequency of occurrence. Habitat PMFs included the deep sponge, coral reef and burrowed mud biotopes with their component species, *Pachycerianthus multiplicatus*, *Funiculina quadrangularis* and *Swiftia pallida*. *Leptometra celtica* aggregations on non-reef substrates and *Parazoanthus anguicomus* aggregations are categorised as low or limited mobility species PMFs.

4 DISCUSSION

Table 1 lists the species recorded during the surveys that have been formally classified as being of conservation importance. Eight of these have been nominated as PMFs and the distribution of these PMF records is illustrated in Figures 15 and 16. There are uncertain records of small numbers of *Ammodytes* spp. off West Mainland and South Ronaldsay, Orkney and *Molva molva* was recorded amongst rocks at the exposed West Mainland and Lewis locations. *Funiculina quadrangularis* was found to be abundant at the southern entrance to Kyle Rhea and common to the south of the Crowlin Islands and at some sites off Mingulay. *Pachycerianthus multiplicatus* was also common off the Crowlin Islands at 205-210 m and widely distributed off Mingulay at 95-183 m. These are unusual records for this anemone, which is generally considered to be restricted in Britain to very sheltered conditions at the heads of sea lochs in 10-130 m (Wilson and Wilding, 2009). Its high abundance at 205-210 m in the Inner Sound, south of the Crowlin Islands, may be related to fishing restrictions resulting from the presence of the dumping grounds in the area. Moen and Svensen (2004) note a depth range of 15-200 m for this species, presumably based on Scandinavian records. The Mingulay area also supported extensive fields of abundant *Leptometra celtica*, widely distributed aggregations of *Parazoanthus anguicomus*, particularly profuse on dead coral substrates, and dense colonies of *Swiftia pallida* at a number of sites in the east of the region. Dense *Atrina fragilis* was present in the deep channel (c. 80-170 m) passing through the Sound of Canna.

Habitats considered to be of high conservation importance are also listed in Table 1. This includes seven PMFs. A tide-swept *Laminaria hyperborea* park on mixed substrata (**IR.MIR.KR.LhypTX.Pk**) was recorded at the southern entrance to Kyle Rhea. Although such sites ideally require diving-based methods to assess their quality, the imagery examined appears to indicate a habitat of at least moderate diversity in the more current-swept areas. Burrowed mud habitats were recorded at the southern entrance to Kyle Rhea and south of the Crowlin Islands, supporting dense *Funiculina quadrangularis* and *Pachycerianthus multiplicatus* populations (**SS.SMu.CFiMu.Spn.Meg.Fun**). The biotope was also widely distributed off Mingulay supporting moderate to high densities of *F. quadrangularis* and fairly sparse *P. multiplicatus*. Southeast of Tiree the video and photo imagery indicated a fairly poorly developed example of the burrowed mud habitat, with predominantly small burrows and no seapens observed (**SS.SMu.CFiMu.Spn.Meg**). East Scapa Flow was found to harbour fairly extensive, albeit patchy, coverage of loose-lying *Phyllophora crispa* on mixed muddy sand (**SS.SMp.KSwSS.Pcri**). Whilst little can be deduced regarding the quality of the infauna in the absence of infaunal sampling, the epibiota appeared to be of low diversity. Given the patchiness of the algae, it is probable that the community is similar to that of the predominant biotope recorded here on the same substrate type (**SS.SMx.CMx**), which is also apparently the dominant biotope in Scapa Flow (Mesh webGIS, 2011).

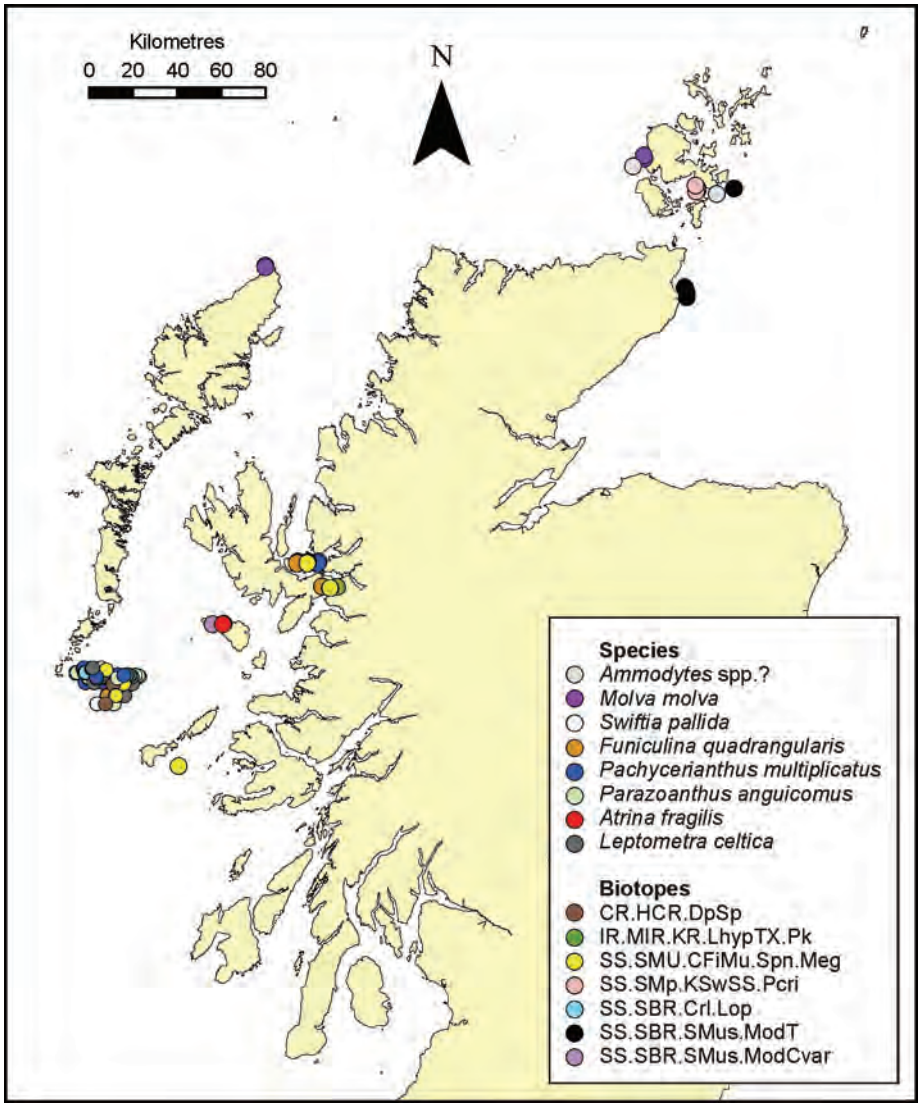
Lophelia pertusa reefs were recorded at three sites off Mingulay (**SS.SBR.Crl.Lop**). Small *Lophelia*-like heads were also observed in poor visibility conditions at a depth of around 100 m in the Sound of Canna, but were considered more likely to be *Filograna implexa*. Mingulay is also notable for the extensive development of deep sponge communities, in places with abundant erect sponges and appearing highly diverse with a fauna including *Swiftia pallida* and *Parazoanthus anguicomus* (**CR.HCR.DpSp**).

Table 1 *Species and biotopes recorded during the surveys of recognised conservation importance and published measures of their sensitivity to the likely effects of marine energy schemes. UK = UK Biodiversity Action Plan Priority Species, SBL = Scottish Biodiversity List Species, Osp = OSPAR List of Threatened and/or Declining Species and Habitats, SCC = Species of Conservation Concern, IUCN = IUCN Red List of Threatened Species (lower risk category), PMF = Priority Marine Feature, SF = MPA Search Feature, SUBS LOSS = substrate loss, SMOTH = smothering by sediment, WAVE RED and FLOW RED = reduction in wave and flow rate respectively. Sensitivities are VH = very high, H = high, M = moderate, L = low, NS = not sensitive, NR = not relevant. Grey shading indicates features not in development areas, yellow and pink shading indicates features at respectively low and potentially high risk of significant impact from marine energy developments*

	Conservation importance							Sensitivity			
	UK	**SBL**	**Osp**	**SCC**	**IUCN**	**PMF**	**SF**	**SUBS LOSS**	**SMOTH**	**WAVE RED**	**FLOW RED**
Species											
Ammodytes marinus	●	●				●	●				
Ammodytes tobianus		●				●	●				
Merluccius merluccius	●	●		●							
Molva molva	●	●		●		●					
Pleuronectes platessa	●	●		●							
Raja montagui			●								
Swiftia pallida	●					●	●	VH	H	NR	M
Funiculina quadrangularis	●			●		●	●	H	NS	NR	M
Pachycerianthus multiplicatus				●		●	●	VH	NS	NR	NR
Parazoanthus anguicomus				●		●					
Nucella lapillus			●	●				H	NS	L	NS
Modiolus modiolus				●				H	H	NS	H
Atrina fragilis	●	●		●		●	●	VH	H		
Leptometra celtica						●	●				
Echinus esculentus				●	●			M	L		
Biotopes											
IR.MIR.KR.LhypT.Pk	●	●									
IR.MIR.KR.LhypTX.Pk	●	●				●	●				
CR.HCR.FaT.CTub	●	●									
CR.HCR.FaT.CTub.Adig	●	●									
CR.HCR.DpSp	●	●				●	●				
CR.HCR.XFa.CvirCri	●	●									
SS.SCS.CCS	●	●									
SS.SSa.CFiSa	●	●									
SS.SSa.CMuSa	●	●									
SS.SSa.OSa	●	●									
SS.SMU.CFiMu.Spn.Meg	●		●			●	●	M	NS	NR	M
SS.SMp.KSwSS.Pcri	●	●				●	●				
SS.SMx.CMx.FluHyd	●	●									
SS.SMx.CMx	●	●									
SS.SBR.Crl.Lop	●	●	●			●					
SS.SBR.SMus.ModT	●	●	●			●	●	VH	H	NS	H
SS.SBR.SMus.ModCvar	●	●	●			●	●				

Modiolus beds were recorded off Noss Head, off Copinsay in the South Ronaldsay survey area, and in the Sound of Canna. The Noss Head and Copinsay beds appear to be good examples of the uncommon biotope, **SS.SBR.SMus.ModT**. The Noss Head site is also very extensive with a coverage possibly of the order of 450 ha. If validated, this could represent the largest known bed in Scottish waters. The extent of the Copinsay bed is unknown. The Canna bed is most unusual. Deep *Modiolus* beds around Britain are generally associated with mixed coarse sediments with a corresponding coarse sediment community including venerid bivalves, and are attributable to **SS.SBR.SMus.ModMx** (Connor *et al*., 2004). The muddy sand substrate, current regime and hydroid/sponge dominated associated community place the Canna biotope closer to the sparsely-recorded **SS.SBR.SMus.ModCvar**, although this is generally associated with sheltered, shallow locations (Connor *et al*., 2004). The associated community at Canna may be atypical as a result of the depth and the degree of sediment-immersion of much of the *Modiolus* population. Robinson *et al.* (2009) also reported a possible deep instance of the **ModCvar** biotope at 127-169 m in the Irish Sea.

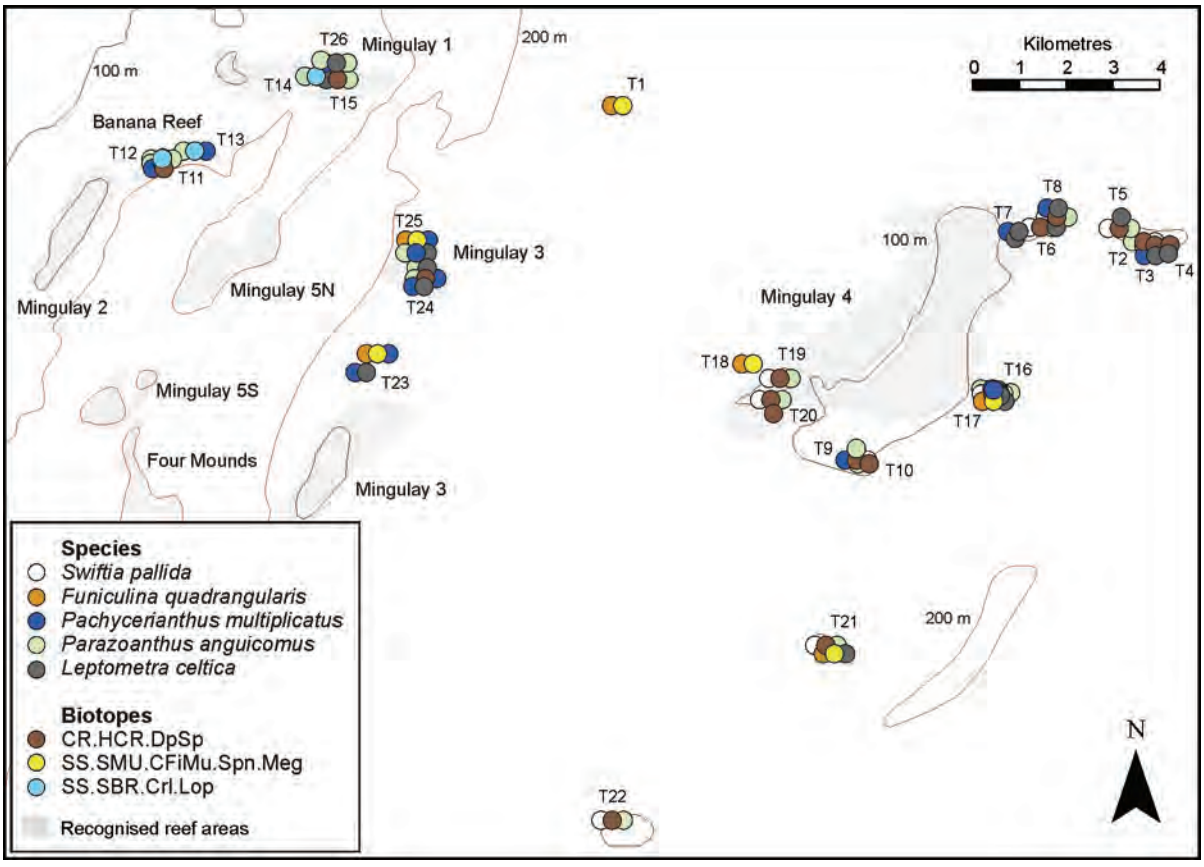
Figure 15 Distribution of PMF records in all survey areas



Faber Maunsell and Metoc (2007) describe the potential effects of the installation and operation of wave and tidal energy devices on benthic ecology. The major impacts identified include substratum loss (due to the presence of seabed devices, associated mooring structures and cabling), smothering by disturbed sediment during installation, and reductions in wave energy and current flows. The sensitivity of recorded species and habitats of high conservation importance to these factors is given in Table 1, where assessments for these features have been published (MarLIN, 2011). Several of the features were only recorded in areas that are not being considered for marine renewable energy developments. These are shaded grey in Table 1 and will not be considered further.

A number of the features are extensively distributed around Scotland and/or are likely to have low sensitivity to the environmental perturbations resulting from energy developments. These are shaded yellow in Table 1. Localised environmental changes in the vicinity of installations are thought most unlikely to have a significant impact on the conservation of such species and habitats. A large proportion of the fish stocking the Shetland sandeel fishery are *Ammodytes marinus* spawned off the west coast of Orkney (Goodlad and Napier, 1997). Although video footage from off the west and east coasts of Orkney revealed the possible presence of small numbers of *Ammodytes* spp., the sediment of fine sand is not the preferred substrate for *A. marinus*, which is medium to coarse sand (Wright *et al.,* 2000; Holland *et al*., 2005).

Figure 16 Distribution of PMF records to the east of Mingulay



Features shaded pink in Table 1 have a more restricted distribution and are located in potential development areas. The burrowed mud habitat was recorded south of Kyle Rhea where it supported abundant *Funiculina quadrangularis*, and southeast of Tiree in a location lying outside the Tiree wave energy development area. In Kyle Rhea, where current turbines would be employed, there is a potential risk of impact through the downstream

reduction in current strength, although the area occupied by the biotope is likely to be a considerable distance from suitable sites for turbine installations. Moreover, due to its location to the south of the entrance to Kyle Rhea, any reduction in flow would only be operative during the ebb tide.

The biotope **SS.SMp.KSwSS.Pcri** in Scapa Flow appears to consist of merely an overlay of scattered concentrations of unattached *Phyllophora crispa* on a mixed muddy sand sediment, that has been recorded extensively in Scapa Flow as **SS.SMx.CMx**. The 2010 survey imagery suggests that the algal patches add little to the area in terms of diversity. These patches may be far more widely distributed in Scapa Flow than records suggest, as most of the biotope records are based on grab sampling, where such features may be overlooked. **SS.SMp.KSwSS.Pcri** is also known to occur on sandy mud substrates and so is unlikely to be sensitive to slight changes in sediment type resulting from reduced wave energy from the testing of wave devices in Scapa Flow. Given the reliance of the characterising species on solar radiation, it is possible that a localised impact may result from smothering during the installation phase, but it is not expected that this would represent a significant threat to conservation of the biotope.

Tidal rapids biotopes were recorded at North Westray, Sound of Stroma and Kyle Rhea. The instances of **CR.HCR.FaT.CTub** in the Sound of Stroma and North Westray appeared to be low diversity examples of the type. Kyle Rhea supported richer examples of the biotopes **CR.HCR.FaT.CTub.Adig**, **IR.MIR.KR.LhypT.Pk** and **IR.MIR.KR.LhypTX.Pk**. A reduction in current speed resulting from the presence of turbines is likely to invoke changes in the communities of these biotopes, but it is not possible to assess whether such changes would be undesirable. Modest reductions, particularly in the relatively impoverished Sound of Stroma and North Westray may well result in enhancement of diversity and biomass.

5 REFERENCES

Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. 2004. The National Marine Habitat Classification for Britain and Ireland. Version 04.05. Peterborough: Joint Nature Conservation Committee. ISBN: 1 861 07561 8 (internet version).

Davies, A.J., Green, S.L., Long, D. & Roberts, J.M. 2009. Developing the necessary data layers to inform the development of a site boundary for the East Mingulay dSAC - Phase II. *Scottish Natural Heritage Commissioned Report No. 306* (ROAME No. 1390).

Faber Maunsell & Metoc 2007. Scottish Marine Renewables SEA Environmental Report Section C SEA Assessment: Chapter C6 Benthic Ecology. *Report to Scottish Executive*.

Goodlad, G. & Napier, I. 1997. Assessment of the Shetland Sandeel Fishery - 1996. *Fisheries Development Note*, *No. 6*. Scalloway: North Atlantic Fisheries College.

Hiscock, K. (ed). 1996. *Marine Nature Conservation Review: Rationale and Methods.* Peterborough: Joint Nature Conservation Committee.

Holland, G.J., Greenstreet, S.P.R., Gibb, I.M, Fraser, H.M. & Robertson, M.R. 2005. Identifying sandeel Ammodytes marinus sediment habitat preferences in the marine environment. *Marine Ecology Progress Series*, **303**, 269-282.

IUCN. 2009. IUCN Red List of Threatened Species. Version 2009.2 <www.iucnredlist.org>. Accessed on 20/03/2011.

MarLIN 2011. The Marine Life Information Network. <http://www.marlin.ac.uk/index.php>. Accessed on 7/03/2011.

Marine Scotland 2011a. Marine Nature Conservation Strategy. <http://www.scotland.gov.uk/Resource/Doc/295194/0115590.pdf>. Accessed on 21/01/2011.

Marine Scotland 2011b. Marine Protected Areas in Scotland's Seas Guidelines on the selection of MPAs and development of the MPA network. <http://www.scotland.gov.uk/Resource/Doc/295194/0114024.pdf>. Accessed on 8/03/2011.

Mesh webGIS 2011. Mesh webGIS & Metadata Catalogue. <http://www.searchmesh.net/default.aspx?page=1934>. Accessed 21/03/2011.

Moen, F.E. & Svensen, E. 2004. *Marine Fish & Invertebrates of Northern Europe.* Kristiansund: Kom.

OSPAR. 2008. List of Threatened and/or Declining Species and Habitats. Reference Number: 2008-6. <http://www.ospar.org/documents/DBASE/DECRECS/Agreements/08-06e_OSPAR%20List%20species%20and%20habitats.doc>. Accessed on 20/03/2011.

Robinson, K.A., Darbyshire, T., Van Landeghem, K., Lindenbaum, C., McBreen, F., Creaven, S., Ramsay, K., Mackie, A.S.Y., Mitchell, N.C., Wheeler, A., Wilson, J.G. & O'Beirn, F. 2009. Habitat mapping for conservation and management of the southern Irish Sea (HABMAP). 1: Seabed surveys. *Studies in Marine Biodiversity and Systematics from the National Museum of Wales. BIOMOR Reports 5(1).*

SNH 2010. Scottish Biodiversity List. < http://www.snh.gov.uk/protecting-scotlands-nature/biodiversity-scotland/scottish-biodiversity-list/>. Accessed on 20/03/2011.

SNH 2011. Priority Marine Features. <http://www.snh.gov.uk/protecting-scotlands-nature/safeguarding-biodiversity/priority-marine-features/priority-marine-features/>. Accessed on 20/03/2011.

Triscom Marine 2010. Horse mussel bed investigation off Noss Head, Oct 21-22 2010. Report TT1015. Unpublished report to Aquatera Ltd, Orkney.

UK Biodiversity Steering Group 1995. *The UK Steering Group Report - Volume II: Action Plans. Annex F Lists of key species, key habitats and broad habitats.* London: HMSO. <http://www.ukbap.org.uk/librarysearchresults.aspx?ID=619>. Accessed on 20/03/2011.

UKBAP 2007. UK List of Priority Species and Habitats. <http://www.ukbap.org.uk/NewPriorityList.aspx>. Accessed on 20/03/2011.

Wilson, E. & Wilding, C. 2009. *Pachycerianthus multiplicatus*. Fireworks anemone. *Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme*. Plymouth: Marine Biological Association of the United Kingdom. <http://www.marlin.ac.uk/speciesinformation.php?speciesID=4003>. Accessed on 05/03/2011

Wright, P.J., Jensen, H. & Tuck, I. 2000. The influence of sediment type on the distribution of the lesser sandeel, Ammodytes marinus. *Journal of Sea Research*, **44**, 243-256.

Appendix 1 Positional and temporal details of video sequences recorded during the surveys. Where there is more than one entry for a site, this reflects splitting of the video run amongst different habitat types

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
Fair Isle	FITV37	09/08/2010	59.49072	-1.66555	59.49036	-1.66208	31	30	0:54:56	1:05:10	Fair Isle - Disc 17
Fair Isle	FITV38	09/08/2010	59.49180	-1.63035	59.48974	-1.62735	55	57	1:33:19	1:48:06	Fair Isle - Disc 17
Fair Isle	FITV39	09/08/2010	59.49085	-1.61258	59.48943	-1.60836	60	60	2:07:56	2:23:10	Fair Isle - Disc 17
Fair Isle	FITV40	09/08/2010	59.49241	-1.57049	59.49023	-1.56705	70	70	2:47:28	3:02:18	Fair Isle - Disc 18
Fair Isle	FITV41	09/08/2010	59.51397	-1.56619	59.51231	-1.56211	57	60	3:27:15	3:42:09	Fair Isle - Disc 18
Fair Isle	FITV42	09/08/2010	59.54290	-1.57347	59.54030	-1.57227	60	60	4:21:43	4:36:07	Fair Isle - Disc 18
Fair Isle	FITV43	09/08/2010	59.53326	-1.68374	59.53472	-1.69361	60	57	5:21:28	5:36:06	Fair Isle - Disc 19
Fair Isle	FITV44	09/08/2010	59.52590	-1.69365	59.52114	-1.69381	51	57	6:06:01	6:21:08	Fair Isle - Disc 19
Fair Isle	FITV45	09/08/2010	59.51036	-1.68968	59.50854	-1.69479	70	75	6:37:47	6:52:06	Fair Isle - Disc 19
West Mainland Orkney	WMO21	09/09/2010	59.01073	-3.37154	59.01314	-3.37370	30	30	15:12:11	15:27:36	West of Mainland Orkney - Disc 1
West Mainland Orkney	WMO22	09/09/2010	59.02390	-3.37404	59.02516	-3.37669	30	30	16:11:45	16:26:05	West of Mainland Orkney - Disc 1
West Mainland Orkney	WMO23	09/09/2010	59.03369	-3.37212	59.03547	-3.37376	30	30	16:36:10	16:51:19	West of Mainland Orkney - Disc 1
West Mainland Orkney	WMO24	09/09/2010	59.04703	-3.36634	59.04950	-3.36515	25	20	17:04:20	17:10:51	West of Mainland Orkney - Disc 1
West Mainland Orkney	WMO24	09/09/2010	59.04703	-3.36634	59.04950	-3.36515	20	20	17:10:51	17:17:59	West of Mainland Orkney - Disc 1
West Mainland Orkney	WMO24	09/09/2010	59.04703	-3.36634	59.04950	-3.36515	20	25	17:17:59	17:19:32	West of Mainland Orkney - Disc 1
West Mainland Orkney	WMO25	09/09/2010	59.06241	-3.36349	59.06379	-3.36334	25	25	17:30:39	17:40:48	West of Mainland Orkney - Disc 2
West Mainland Orkney	WMO26	09/09/2010	59.06908	-3.36131	59.07045	-3.36168	25	25	17:48:36	17:58:37	West of Mainland Orkney - Disc 2
West Mainland Orkney	WMO27	10/09/2010	59.09008	-3.36441	59.09416	-3.36937	20	25	7:15:39	7:18:04	West of Mainland Orkney - Disc 3

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
West Mainland Orkney	WMO27	10/09/2010	59.09008	-3.36441	59.09416	-3.36937	25	30	7:18:04	7:30:42	West of Mainland Orkney - Disc 3
West Mainland Orkney	WMO28	10/09/2010	59.09471	-3.36496	59.10092	-3.37064	25	25	7:42:56	7:48:35	West of Mainland Orkney - Disc 3
West Mainland Orkney	WMO28	10/09/2010	59.09471	-3.36496	59.10092	-3.37064	25	30	7:48:35	8:02:07	West of Mainland Orkney - Disc 3
West Mainland Orkney	WMO29	10/09/2010	59.10836	-3.36747	59.11305	-3.37150	25	35	8:12:16	8:27:22	West of Mainland Orkney - Disc 3
West Mainland Orkney	WMO30	10/09/2010	59.11970	-3.35466	59.12531	-3.35740	30	30	8:39:50	8:55:10	West of Mainland Orkney - Disc 4
West Mainland Orkney	WMO31	10/09/2010	59.14761	-3.28973	59.14771	-3.29766	30	30	9:18:48	9:33:55	West of Mainland Orkney - Disc 4
West Mainland Orkney	WMO32	10/09/2010	59.15757	-3.24257	59.16083	-3.23887	30	40	9:52:22	10:07:29	West of Mainland Orkney - Disc 4
West Mainland Orkney	WMO33	11/09/2010	58.97841	-3.46261	58.97874	-3.46011	66	66	8:02:31	8:17:45	West of Mainland Orkney - Disc 6
West Mainland Orkney	WMO34	11/09/2010	58.98524	-3.50981	58.98590	-3.50677	65	65	8:40:01	8:40:44	West of Mainland Orkney - Disc 6
West Mainland Orkney	WMO34	11/09/2010	58.98524	-3.50981	58.98590	-3.50677	65	65	8:40:44	8:50:08	West of Mainland Orkney - Disc 6
West Mainland Orkney	WMO35	11/09/2010	58.99600	-3.45466	58.99705	-3.45203	65	65	9:11:39	9:21:49	West of Mainland Orkney - Disc 6
West Mainland Orkney	WMO36	11/09/2010	59.01224	-3.44709	59.01374	-3.44579	69	69	9:35:19	9:38:26	West of Mainland Orkney - Disc 6
West Mainland Orkney	WMO36	11/09/2010	59.01224	-3.44709	59.01374	-3.44579	69	69	9:38:26	9:45:24	West of Mainland Orkney - Disc 6
West Mainland Orkney	WMO37	11/09/2010	59.02027	-3.48827	59.02250	-3.48385	69	69	10:04:23	10:19:24	West of Mainland Orkney - Disc 6
West Mainland Orkney	WMO38	11/09/2010	59.02934	-3.43646	59.03066	-3.43361	70	70	11:01:13	11:05:56	West of Mainland Orkney - Disc 7

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
West Mainland Orkney	WMO38	11/09/2010	59.02934	-3.43646	59.03066	-3.43361	70	70	11:05:56	11:07:35	West of Mainland Orkney - Disc 7
West Mainland Orkney	WMO38	11/09/2010	59.02934	-3.43646	59.03066	-3.43361	70	70	11:07:35	11:11:10	West of Mainland Orkney - Disc 7
West Mainland Orkney	WMO39	11/09/2010	59.05256	-3.47145	59.05480	-3.46901	70	70	11:39:40	11:49:55	West of Mainland Orkney - Disc 7
West Mainland Orkney	WMO40	11/09/2010	59.04756	-3.42160	59.04838	-3.41948	62	62	13:26:01	13:35:56	West of Mainland Orkney - Disc 7
West Mainland Orkney	WMO41	11/09/2010	59.06948	-3.40987	59.07066	-3.40695	55	55	14:14:20	14:24:33	West of Mainland Orkney - Disc 7
West Mainland Orkney	WMO43	11/09/2010	59.09497	-3.40097	59.09490	-3.39932	48	48	14:34:04	14:44:11	West of Mainland Orkney - Disc 7
West Mainland Orkney	WMO44	11/09/2010	59.10926	-3.39835	59.10856	-3.39710	55	55	14:58:24	15:08:27	West of Mainland Orkney - Disc 8
West Mainland Orkney	WMO45	11/09/2010	59.20620	-3.30909	59.20517	-3.31056	70	70	16:06:24	16:16:23	West of Mainland Orkney - Disc 8
West Mainland Orkney	WMO46	11/09/2010	59.23236	-3.27348	59.23076	-3.27349	74	74	16:38:26	16:50:22	West of Mainland Orkney - Disc 8
North Westray	NW3	10/09/2010	59.18452	-2.88042	59.18878	-2.88525	39	39	12:23:25	12:33:34	North Westray - Disc 5
South Ronaldsay	SR10	13/09/2010	58.74857	-2.81400	58.75278	-2.81286	66	66	8:53:35	9:03:41	South Ronaldsay - Disc 13
South Ronaldsay	SR11	13/09/2010	58.75551	-2.75551	58.75905	-2.75331	71	74	9:28:13	9:38:10	South Ronaldsay - Disc 13
South Ronaldsay	SR12	13/09/2010	58.76592	-2.68252	58.76944	-2.67851	68	68	9:58:23	10:08:30	South Ronaldsay - Disc 13
South Ronaldsay	SR13	13/09/2010	58.76346	-2.83825	58.76661	-2.83776	58	58	10:57:20	11:07:21	South Ronaldsay - Disc 13
South Ronaldsay	SR14	13/09/2010	58.76728	-2.78434	58.76936	-2.78278	68	68	11:27:06	11:37:08	South Ronaldsay - Disc 13

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
South Ronaldsay	SR15	13/09/2010	58.77406	-2.72879	58.77523	-2.72788	69	69	11:59:11	12:09:13	South Ronaldsay - Disc 13
South Ronaldsay	SR16	13/09/2010	58.79574	-2.69554	58.79613	-2.69601	60	60	12:31:00	12:36:22	South Ronaldsay - Disc 14
South Ronaldsay	SR17	13/09/2010	58.78796	-2.74995	58.78789	-2.75015	65	65	12:59:14	13:04:27	South Ronaldsay - Disc 14
South Ronaldsay	SR18	13/09/2010	58.78259	-2.80631	58.78195	-2.80987	60	60	13:24:58	13:34:57	South Ronaldsay - Disc 14
South Ronaldsay	SR19	13/09/2010	58.80473	-2.77865	58.80446	-2.78142	60	60	13:58:41	14:08:43	South Ronaldsay - Disc 14
South Ronaldsay	SR20	13/09/2010	58.80961	-2.71939	58.80948	-2.72144	60	60	14:33:23	14:43:24	South Ronaldsay - Disc 14
South Ronaldsay	SR21	13/09/2010	58.82671	-2.75169	58.82759	-2.75600	55	55	15:01:25	15:11:31	South Ronaldsay - Disc 14
South Ronaldsay	SR22	13/09/2010	58.89785	-2.73084	58.89835	-2.73048	29	31	16:02:50	16:04:17	South Ronaldsay - Disc 14
South Ronaldsay	SR24	13/09/2010	58.89424	-2.65845	58.89639	-2.65975	40	36	16:28:53	16:39:17	South Ronaldsay - Disc 15
South Ronaldsay	SR25	14/09/2010	58.84733	-2.82162	58.84951	-2.81491	36	36	11:40:01	11:50:14	South Ronaldsay - Disc 16
South Ronaldsay	SR26	14/09/2010	58.83470	-2.78599	58.83540	-2.77847	51	53	12:07:46	12:17:53	South Ronaldsay - Disc 16
South Ronaldsay	SR27	14/09/2010	58.86039	-2.79375	58.86085	-2.78682	40	42	12:38:46	12:47:53	South Ronaldsay - Disc 16
South Ronaldsay	SR27	14/09/2010	58.86039	-2.79375	58.86085	-2.78682	42	42	12:47:53	12:48:20	South Ronaldsay - Disc 16
South Ronaldsay	SR27	14/09/2010	58.86039	-2.79375	58.86085	-2.78682	42	42	12:48:20	12:49:38	South Ronaldsay - Disc 16
South Ronaldsay	SR28	14/09/2010	58.87222	-2.79973	58.87325	-2.79509	33	34	13:06:19	13:16:28	South Ronaldsay - Disc 16

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
South Ronaldsay	SR29	14/09/2010	58.89005	-2.76818	58.89027	-2.75908	26	28	13:31:44	13:41:44	South Ronaldsay - Disc 16
South Ronaldsay	SR30	14/09/2010	58.87760	-2.75789	58.87885	-2.75318	35	35	13:58:57	14:09:03	South Ronaldsay - Disc 16
South Ronaldsay	SR31	14/09/2010	58.85941	-2.82620	58.85940	-2.82198	31	32	14:37:57	14:40:12	South Ronaldsay - Disc 17
South Ronaldsay	SR31	14/09/2010	58.85941	-2.82620	58.85940	-2.82198	32	32	14:40:12	14:40:56	South Ronaldsay - Disc 17
Scapa Flow	SF4	12/09/2010	58.89785	-2.95195	58.89656	-2.94862	22	22	8:26:21	8:36:45	Scapa Flow - Disc 9
Scapa Flow	SF5	12/09/2010	58.89411	-2.95343	58.89294	-2.94502	25	22	8:47:35	9:09:33	Scapa Flow - Disc 9
Scapa Flow	SF6	12/09/2010	58.89229	-2.95162	58.89092	-2.94374	24	22	9:20:07	9:40:10	Scapa Flow - Disc 9
Scapa Flow	SF7	12/09/2010	58.88984	-2.94958	58.88872	-2.94392	24	23	9:52:58	10:08:03	Scapa Flow - Disc 10
Scapa Flow	SF8	12/09/2010	58.88529	-2.94068	58.88540	-2.93874	24	24	10:17:13	10:29:17	Scapa Flow - Disc 10
Scapa Flow	SF9	12/09/2010	58.88148	-2.95936	58.87990	-2.95455	24	24	11:12:43	11:27:48	Scapa Flow - Disc 10
Scapa Flow	SF10	12/09/2010	58.89039	-2.97729	58.88955	-2.97396	31	30	11:43:17	11:53:15	Scapa Flow - Disc 10
Scapa Flow	SF12	12/09/2010	58.89741	-2.95606	58.89661	-2.95348	22	22	12:20:22	12:25:30	Scapa Flow - Disc 11
Scapa Flow	SF13	12/09/2010	58.89452	-2.94580	58.89349	-2.94287	21	21	12:45:13	12:50:20	Scapa Flow - Disc 11
Scapa Flow	SF14	12/09/2010	58.90484	-2.96444	58.90394	-2.96066	23	23	13:03:57	13:14:05	Scapa Flow - Disc 11
Scapa Flow	SF15	12/09/2010	58.91475	-2.96538	58.91374	-2.96184	23	22	13:25:32	13:35:32	Scapa Flow - Disc 11
Scapa Flow	SF16	12/09/2010	58.91045	-2.97739	58.90988	-2.97416	27	27	13:46:45	13:56:45	Scapa Flow - Disc 11

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
Scapa Flow	SF17	12/09/2010	58.90734	-2.99444	58.90669	-2.99151	30	30	14:07:00	14:17:00	Scapa Flow - Disc 12
Scapa Flow	SF18	12/09/2010	58.90185	-2.97681	58.90120	-2.97386	27	27	14:26:19	14:36:20	Scapa Flow - Disc 12
Sound of Stroma	SOS1/09	01/10/2009	58.66023	-3.12693	58.65934	-3.11587	32	32	9:46:05	10:18:03	Gills Bay - Sound of Stroma - Disc 1
Sound of Stroma	SOS2/09	01/10/2009	58.66089	-3.12655	58.66074	-3.12389	31	30	10:32:14	10:39:24	Gills Bay - Sound of Stroma - Disc 1
Sound of Stroma	SOS1/10	25/05/2010	58.65747	-3.12229	58.65746	-3.11468	31	31	15:57:51	16:12:58	Gills Bay - Sound of Stroma - Disc 20
Sound of Stroma	SOS2/10	25/05/2010	58.65893	-3.12143	58.65900	-3.11262	32	32	16:20:05	16:35:16	Gills Bay - Sound of Stroma - Disc 20
Sound of Stroma	SOS3/10	25/05/2010	58.66045	-3.11227	58.66108	-3.11719	30	29	16:40:08	16:55:16	Gills Bay - Sound of Stroma - Disc 20
Noss Head	NH21/D1	21/10/2010	58.46271	-3.02132	58.46774	-3.02287	40	41	14:44:36	14:55:53	Noss HD - 21.10.10 - Disc 1
Noss Head	NH21/D2	21/10/2010	58.48009	-3.02985	58.48411	-3.03155	41	40	15:13:20	15:23:54	Noss HD - 21.10.10 - Disc 1
Noss Head	NH21/D3	21/10/2010	58.48881	-3.03539	58.48881	-3.03539	41	41	15:47:24	15:49:21	Noss HD - 21.10.10 - Disc 1
Noss Head	NH22/D1	22/10/2010	58.44733	-3.02776	58.43776	-3.02859	41	43	8:31:10	8:48:47	Noss HD - 22.10.10 - Disc 1
Noss Head	NH22/D2	22/10/2010	58.45170	-3.02159	58.44685	-3.01950	42	45	9:11:57	9:22:42	Noss HD - 22.10.10 - Disc 1
Noss Head	NH22/D3	22/10/2010	58.44671	-3.01622	58.44255	-3.01287	47	48	9:34:45	9:46:50	Noss HD - 22.10.10 - Disc 1
Noss Head	NH22/D3	22/10/2010	58.44255	-3.01287	58.43828	-3.01418	48	48	9:46:50	9:56:46	Noss HD - 22.10.10 - Disc 1
Noss Head	NH22/D4	22/10/2010	58.46278	-3.03330	58.46055	-3.02765	29	39	10:32:03	10:42:51	Noss HD - 22.10.10 - Disc 1

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
Noss Head	NH22/D4	22/10/2010	58.46055	-3.02765	58.45726	-3.01174	39	46	10:42:51	11:18:08	Noss HD - 22.10.10 - Disc 1
Noss Head	NH22/D5	22/10/2010	58.45698	-3.01176	58.45386	-3.02658	46	41	11:21:44	11:48:23	Noss HD - 22.10.10 - Disc 2
Noss Head	NH22/D6	22/10/2010	58.42772	-3.04462	58.42812	-3.04035	39	41	12:27:26	12:37:13	Noss HD - 22.10.10 - Disc 2
Noss Head	NH22/D6	22/10/2010	58.42812	-3.04035	58.42840	-3.03617	41	43	12:37:13	12:45:02	Noss HD - 22.10.10 - Disc 2
Noss Head	NH22/D6	22/10/2010	58.42840	-3.03617	58.43422	-3.01983	43	49	12:45:02	13:12:49	Noss HD - 22.10.10 - Disc 2
Noss Head	NH22/D7	22/10/2010	58.49700	-3.04447	58.49700	-3.04447	44	44	14:05:42	14:07:26	Noss HD - 22.10.10 - Disc 2
Lewis	LW2	25/07/2010	58.46570	-6.38920	58.46321	-6.39695	23	23	13:41:07	14:11:29	Lewis - Disc 2
Lewis	LW3	27/07/2010	58.53276	-6.24290	58.53007	-6.24620	33	33	11:09:25	11:29:37	Lewis - Disc 3
Lewis	LW4	27/07/2010	58.50521	-6.31937	58.50181	-6.32224	35	35	12:27:06	12:47:11	Lewis - Disc 3
Lewis	LW5	27/07/2010	58.41283	-6.51826	58.41118	-6.52429	24	24	13:53:47	14:14:02	Lewis - Disc 3
Lewis	LW6	27/07/2010	58.39699	-6.60207	58.39859	-6.59672	35	35	14:42:43	14:56:21	Lewis - Disc 4
Lewis	LW7	27/07/2010	58.30955	-6.83744	58.30374	-6.84210	42	42	16:26:03	16:39:06	Lewis - Disc 4
Lewis	LW7	27/07/2010	58.30955	-6.83744	58.30374	-6.84210	42	42	16:39:06	16:49:28	Lewis - Disc 4
Lewis	LW7	27/07/2010	58.30955	-6.83744	58.30374	-6.84210	42	42	16:49:28	16:51:35	Lewis - Disc 4
Lewis	LW7	27/07/2010	58.30955	-6.83744	58.30374	-6.84210	42	42	16:51:35	16:56:12	Lewis - Disc 4
Lewis	LW8	27/07/2010	58.30745	-6.85154	58.30149	-6.85784	51	48	17:11:22	7:41:35	Lewis - Disc 5
Lewis	LW9	28/07/2010	58.43539	-6.48838	58.43394	-6.49398	25	25	10:20:42	10:35:44	Lewis - Disc 6
Lewis	LW10	28/07/2010	58.42747	-6.50082	58.42645	-6.50906	21	*22*	11:13:26	11:26:45	Lewis - Disc 6
Lewis	LW10	28/07/2010	58.42747	-6.50082	58.42645	-6.50906	*22*	22	11:26:45	11:33:08	Lewis - Disc 6
Lewis	LW11	28/07/2010	58.40500	-6.53753	58.40363	-6.54537	25	25	11:54:43	12:15:04	Lewis - Disc 6
Lewis	LW12	28/07/2010	58.39963	-6.60305	58.39927	-6.61106	38	38	12:36:58	12:57:09	Lewis - Disc 17
Lewis	LW13	28/07/2010	58.38106	-6.68044	58.37879	-6.68805	30	30	13:23:58	13:44:04	Lewis - Disc 17
Lewis	LW14	28/07/2010	58.38249	-6.67388	58.38070	-6.68314	30	30	14:00:07	14:15:16	Lewis - Disc 17
Lewis	LW15	28/07/2010	58.46115	-6.46112	58.46071	-6.46822	26	27	15:28:41	15:44:58	Lewis - Disc 18

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
Lewis	LW16	29/07/2010	58.52453	-6.28642	58.52384	-6.29474	32	32	11:35:29	11:55:19	Lewis - Disc 9
Lewis	LW17	29/07/2010	58.52376	-6.29759	58.52195	-6.30648	32	38	12:04:21	12:24:20	Lewis - Disc 9
Lewis	LW18	29/07/2010	58.51745	-6.29652	58.51288	-6.30272	27	34	12:41:00	13:01:11	Lewis - Disc 9
Lewis	LW19	29/07/2010	58.51218	-6.30302	58.50751	-6.30634	34	33	13:04:56	13:25:09	Lewis - Disc 10
Lewis	LW20	29/07/2010	58.50458	-6.30009	58.50291	-6.30745	28	31	13:40:46	14:00:15	Lewis - Disc 10
Lewis	LW21	29/07/2010	58.49794	-6.32914	58.49749	-6.33768	30	35	14:17:15	14:37:13	Lewis - Disc 10
Lewis	LW22	29/07/2010	58.49364	-6.36724	58.49466	-6.37654	38	43	14:57:11	15:17:20	Lewis - Disc 11
Lewis	LW23	29/07/2010	58.47803	-6.38589	58.47754	-6.39347	27	27	15:37:50	15:58:10	Lewis - Disc 11
Lewis	LW24	29/07/2010	58.47569	-6.41258	58.47884	-6.41577	31	32	16:41:27	17:01:41	Lewis - Disc 11
Lewis	LW25	29/07/2010	58.46584	-6.41497	58.46650	-6.42157	25	27	17:19:11	17:39:20	Lewis - Disc 12
Lewis	LW26	02/08/2010	58.34813	-6.71128	58.34776	-6.71665	25	25	10:09:50	10:24:56	Lewis - Disc 13
Lewis	LW27	02/08/2010	58.33727	-6.77803	58.33545	-6.78392	30	30	11:04:23	11:13:18	Lewis - Disc 12
Lewis	LW27	02/08/2010	58.33727	-6.77803	58.33545	-6.78392	30	30	11:13:18	11:24:08	Lewis - Disc 13
Lewis	LW28	02/08/2010	58.33764	-6.82655	58.33746	-6.83375	45	45	11:48:33	11:49:10	Lewis - Disc 12
Lewis	LW28	02/08/2010	58.33764	-6.82655	58.33746	-6.83375	45	45	11:49:10	11:54:08	Lewis - Disc 13
Lewis	LW28	02/08/2010	58.33764	-6.82655	58.33746	-6.83375	45	45	11:54:08	11:59:08	Lewis - Disc 13
Lewis	LW28	02/08/2010	58.33764	-6.82655	58.33746	-6.83375	45	45	11:59:08	12:08:25	Lewis - Disc 13
Lewis	LW29	02/08/2010	58.32084	-6.89913	58.32009	-6.90303	50	50	12:48:03	13:03:07	Lewis - Disc 24
Lewis	LW30	02/08/2010	58.30718	-6.90638	58.30673	-6.91349	40	55	13:22:30	13:42:15	Lewis - Disc 24
Lewis	LW31	02/08/2010	58.29200	-6.94125	58.29001	-6.94763	58	58	14:03:59	14:17:16	Lewis - Disc 24
Lewis	LW31	02/08/2010	58.29200	-6.94125	58.29001	-6.94763	58	58	14:17:16	14:24:08	Lewis - Disc 24
Lewis	LW32	02/08/2010	58.28756	-6.96294	58.28914	-6.96718	66	66	14:37:00	14:52:04	Lewis - Disc 15
Lewis	LW33	02/08/2010	58.29250	-6.95885	58.29099	-6.96191	65	65	15:10:54	15:26:04	Lewis - Disc 15
Lewis	LW34	02/08/2010	58.37240	-6.74585	58.37080	-6.75124	30	30	16:31:20	16:46:40	Lewis - Disc 15
Lewis	LW35	02/08/2010	58.45006	-6.54065	58.44618	-6.54177	35	35	8:20:42	18:41:05	Lewis - Disc 16
Lewis	LW36	02/08/2010	58.46715	-6.49265	58.46313	-6.49308	40	40	19:07:40	19:27:48	Lewis - Disc 16
Crowlin Islands	CITV1	21/05/2010	57.31619	-5.84249	57.31538	-5.84138	210	210	13:57:07	14:07:28	Crowlin Islands - Disc 14
Crowlin Islands	CITV2	21/05/2010	57.31142	-5.84056	57.31026	-5.84069	180	180	14:25:41	14:35:50	Crowlin Islands - Disc 14

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
Crowlin Islands	CITV3	21/05/2010	57.31014	-5.84804	57.30901	-5.84833	205	205	14:54:03	15:04:18	Crowlin Islands - Disc 14
Kyle Rhea	KR1/10	13/05/2010	57.22368	-5.65012	57.22082	-5.64444	17	*30*	17:51:54	18:09:15	Kyle Rhea - Disc 1
Kyle Rhea	KR1/10	13/05/2010	57.22368	-5.65012	57.22082	-5.64444	*30*	40	18:09:15	18:18:27	Kyle Rhea - Disc 1
Kyle Rhea	KR2/10	13/05/2010	57.22310	-5.65444	57.21857	-5.64921	15	*20*	18:32:14	18:45:32	Kyle Rhea - Disc 1
Kyle Rhea	KR2/10	13/05/2010	57.22310	-5.65444	57.21857	-5.64921	*20*	40	18:45:32	18:57:23	Kyle Rhea - Disc 1
Kyle Rhea	KR3/10	13/05/2010	57.22650	-5.65972	57.22131	-5.65460	17	12	19:09:18	19:35:14	Kyle Rhea - Disc 2
Kyle Rhea	KR1/09	05/10/2009	57.23404	-5.66226	57.23184	-5.66160	33	35	12:31:55	12:46:56	Kyle Rhea - Disc 6
Sound of Canna	SCTV1	20/05/2010	57.04593	-6.44735	57.04410	-6.44952	80	110	12:40:30	12:55:38	Sound of Canna - Disc 13
Sound of Canna	SCTV2	20/05/2010	57.04377	-6.44952	57.04211	-6.45268	120	170	13:21:02	13:36:21	Sound of Canna - Disc 13
Sound of Canna	SCTV3	20/05/2010	57.04256	-6.44715	57.04082	-6.44954	160	180	14:00:54	14:16:23	Sound of Canna - Disc 13
Tiree East	TRE1	15/05/2010	56.45275	-6.74037	56.45130	-6.74304	53	59	14:25:30	14:35:33	Tiree East - Disc 4
Tiree East	TRE2	15/05/2010	56.45992	-6.78176	56.45799	-6.78505	46	47	14:56:21	15:02:13	Tiree East - Disc 4
Tiree East	TRE2	15/05/2010	56.45992	-6.78176	56.45799	-6.78505	47	48	15:02:13	15:11:28	Tiree East - Disc 4
Tiree East	TRE3	15/05/2010	56.51265	-6.70692	56.50994	-6.71099	34	34	17:39:56	17:55:02	Tiree East - Disc 4
Tiree East	TRE4	15/05/2010	56.50566	-6.66498	56.50358	-6.66807	60	60	18:15:30	18:30:36	Tiree East - Disc 4
Tiree East	TRE5	16/05/2010	56.46932	-6.82815	56.46774	-6.82961	20	20	8:15:27	8:36:25	Tiree East - Disc 5
Tiree East	TRE6	16/05/2010	56.49275	-6.76422	56.49103	-6.76451	30	30	8:54:18	9:04:23	Tiree East - Disc 5
Tiree East	TRE7	16/05/2010	56.48222	-6.74866	56.48041	-6.75020	29	29	9:16:16	9:25:52	Tiree East - Disc 5
Tiree East	TRE7	16/05/2010	56.48222	-6.74866	56.48041	-6.75020	29	29	9:25:52	9:26:26	Tiree East - Disc 5
Tiree East	TRE8	16/05/2010	56.45461	-6.70827	56.45257	-6.70876	96	96	9:50:51	10:00:55	Tiree East - Disc 5
Tiree North	TRN1	14/05/2010	56.63842	-7.00076	56.63672	-7.00431	76	76	17:20:03	17:40:14	Tiree - Disc 3
Tiree North	TRN2	14/05/2010	56.59729	-6.94412	56.59600	-6.95042	50	50	18:12:57	18:33:04	Tiree - Disc 3
Tiree North	TRN3	14/05/2010	56.57043	-6.90640	56.56979	-6.91287	30	30	18:56:21	19:16:23	Tiree - Disc 3
Tiree West	TRW1	16/05/2010	56.37663	-7.20239	56.37800	-7.20481	50	50	13:13:41	13:23:49	Tiree West - Disc 6
Tiree West	TRW2	16/05/2010	56.38424	-7.16449	56.38567	-7.16743	50	50	13:43:52	13:53:58	Tiree West - Disc 6
Tiree West	TRW3	16/05/2010	56.40453	-7.08079	56.40618	-7.08299	20	20	14:26:15	14:36:18	Tiree West - Disc 6

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
Tiree West	TRW4	16/05/2010	56.51815	-7.10109	56.52093	-7.10013	24	25	15:29:30	15:39:33	Tiree West - Disc 6
Tiree West	TRW5	16/05/2010	56.54260	-7.18126	56.54222	-7.18555	60	60	16:08:22	16:18:24	Tiree West - Disc 6
Islay North	NIS1	17/05/2010	56.02032	-6.88311	56.01940	-6.88603	50	50	11:00:31	11:10:36	Islay - Disc 7
Islay North	NIS2	17/05/2010	56.01607	-6.78395	56.01824	-6.78576	50	50	11:55:28	12:05:29	Islay - Disc 7
Islay North	NIS3	17/05/2010	56.01700	-6.69000	56.01869	-6.69121	55	55	12:39:04	12:49:09	Islay - Disc 7
Islay North	NIS4	17/05/2010	56.01455	-6.59307	56.01610	-6.59482	50	50	13:23:03	13:33:08	Islay - Disc 7
Islay North	NIS5	17/05/2010	56.01453	-6.49601	56.01606	-6.49705	50	50	14:08:28	14:18:34	Islay - Disc 7
Islay North	NIS6	17/05/2010	56.01289	-6.41671	56.01485	-6.41648	52	52	14:46:27	14:47:20	Islay - Disc 7
Islay North	NIS6	17/05/2010	56.01289	-6.41671	56.01485	-6.41648	52	52	14:47:20	14:56:29	Islay - Disc 7
Islay North	NIS7	17/05/2010	56.04837	-6.37984	56.05055	-6.37829	30	30	15:21:02	15:24:42	Islay - Disc 8
Islay North	NIS7	17/05/2010	56.04837	-6.37984	56.05055	-6.37829	30	30	15:24:42	15:31:06	Islay - Disc 8
Islay North	NIS8	17/05/2010	55.99093	-6.39570	55.98869	-6.39922	22	22	16:07:48	16:22:54	Islay - Disc 8
Islay North	NIS9	17/05/2010	55.97462	-6.45017	55.97258	-6.45309	50	50	17:10:02	17:20:05	Islay - Disc 8
Mull of Kintyre	MOK27	13/10/2009	55.43081	-5.79703	55.42855	-5.79464	23	23	12:11:04	12:21:21	South West Kintyre - Disc 15
Mull of Kintyre	MOK28	13/10/2009	55.40054	-5.82356	55.39763	-5.82352	25	25	12:41:27	12:51:33	South West Kintyre - Disc 15
Mull of Kintyre	MOK29	13/10/2009	55.39575	-5.87835	55.39438	-5.87532	58	58	13:14:58	13:25:33	South West Kintyre - Disc 15
Mull of Kintyre	MOK30	13/10/2009	55.41939	-5.85850	55.41618	-5.85923	28	28	16:01:18	16:11:28	South West Kintyre - Disc 15
Mull of Kintyre	MOK31	13/10/2009	55.44292	-5.83572	55.44081	-5.83639	21	21	16:36:16	16:46:18	South West Kintyre - Disc 16
Mull of Kintyre	MOK32	13/10/2009	55.46724	-5.86561	55.46875	-5.86792	40	40	17:07:54	17:18:02	South West Kintyre - Disc 16
Mingulay	T1	24/04/2010	56.81773	-7.28785	56.82633	-7.28564	159	162	13:32:24	14:03:48	ovrh_24.4.10(1)
Mingulay	T2	29/04/2010	56.80383	-7.10082	56.80320	-7.10121	86	102	9:55:30	10:24:00	ovrh_24.4.10(1)
Mingulay	T3	29/04/2010	56.80396	-7.09664	56.80201	-7.09767	69	113	11:38:28	12:08:35	ovrh_24.4.10(1)
Mingulay	T3	29/04/2010	56.80201	-7.09767	56.80013	-7.09546	113	133	12:08:35	12:42:20	ovrh_24.4.10(1)
Mingulay	T4	29/04/2010	56.80546	-7.08965	56.80459	-7.09203	34	61	13:22:40	13:30:20	ovrh_29.4.10(1)

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
Mingulay	T4	29/04/2010	56.80459	-7.09203	56.80212	-7.09171	61	117	13:30:20	13:40:30	ovrh_29.4.10(1)
Mingulay	T4	29/04/2010	56.80212	-7.09171	56.80117	-7.09288	117	129	13:40:30	13:45:00	ovrh_29.4.10(1)
Mingulay	T5	29/04/2010	56.80383	-7.11049	56.80779	-7.10965	102	106	14:20:48	14:44:00	ovrh_29.4.10(1)
Mingulay	T5	29/04/2010	56.80779	-7.10965	56.80818	-7.10941	106	120	14:44:00	14:46:43	ovrh_29.4.10(1)
Mingulay	T6	29/04/2010	56.80368	-7.13787	56.80597	-7.13707	73	46	15:10:55	15:26:35	ovrh_29.4.10(1)
Mingulay	T7	29/04/2010	56.80159	-7.14687	56.80314	-7.14540	107	109	16:20:45	16:28:40	ovrh_29.4.10(1)
Mingulay	T7	29/04/2010	56.80314	-7.14540	56.80426	-7.14485	109	113	16:28:40	16:35:00	ovrh_29.4.10(1)
Mingulay	T8	29/04/2010	56.80408	-7.13148	56.80433	-7.13173	110	109	16:51:10	16:53:29	ovrh_29.4.10(1)
Mingulay	T8	29/04/2010	56.80433	-7.13173	56.80576	-7.13256	109	75	16:53:29	17:02:55	ovrh_29.4.10(1)
Mingulay	T8	29/04/2010	56.80576	-7.13256	56.80835	-7.13186	75	122	17:02:55	17:15:25	ovrh_29.4.10(1)
Mingulay	T8	29/04/2010	56.80835	-7.13186	56.80912	-7.13198	122	127	17:15:25	17:20:00	ovrh_29.4.10(1)
Mingulay	T9	30/04/2010	56.75913	-7.19537	56.75614	-7.19622	95	99	9:16:45	9:34:40	ovrh_29.4.10(1)
Mingulay	T10	30/04/2010	56.75774	-7.19017	56.75648	-7.19219	96	97	9:53:42	10:24:15	ovrh_29.4.10(1)
Mingulay	T11	30/04/2010	56.80573	-7.44175	56.80442	-7.44371	119	138	11:49:50	11:56:33	ovrh_29.4.10(1)
Mingulay	T12	30/04/2010	56.80520	-7.44582	56.80496	-7.44616	150	147	13:23:48	13:26:30	ovrh_29.4.10(1)
Mingulay	T12	30/04/2010	56.80496	-7.44616	56.80477	-7.44629	147	142	12:26:30	13:28:10	ovrh_29.4.10(1)
Mingulay	T12	30/04/2010	56.80477	-7.44629	56.80334	-7.44590	142	140	13:28:10	13:46:00	ovrh_29.4.10(1)
Mingulay	T12	30/04/2010	56.80334	-7.44590	56.80274	-7.44497	140	174	13:46:00	13:56:12	ovrh_29.4.10(1)
Mingulay	T13	30/04/2010	56.80706	-7.43564	56.80676	-7.43431	142	149	14:13:33	14:43:01	ovrh_30.4.10(2)
Mingulay	T14	30/04/2010	56.82287	-7.39578	56.82335	-7.39365	124	129	15:08:18	15:24:55	ovrh_30.4.10(2)
Mingulay	T15	30/04/2010	56.82109	-7.38933	56.82448	-7.38517	128	156	16:17:45	16:48:30	ovrh_30.4.10(2)
Mingulay	T16	02/05/2010	56.77307	-7.14822	56.77281	-7.14788	100	110	9:10:15	9:15:31	ovrh_02.5.10(1)
Mingulay	T16	02/05/2010	56.77281	-7.14788	56.77218	-7.14724	110	122	9:15:31	9:23:51	ovrh_02.5.10(1)
Mingulay	T16	02/05/2010	56.77218	-7.14724	56.77201	-7.14707	122	130	9:23:51	9:27:20	ovrh_02.5.10(1)
Mingulay	T16	02/05/2010	56.77201	-7.14707	56.77183	-7.14695	130	133	9:27:20	9:28:38	ovrh_02.5.10(1)
Mingulay	T17	02/05/2010	56.77317	-7.15033	56.77308	-7.15031	102	101	9:46:58	9:48:28	ovrh_02.5.10(1)
Mingulay	T17	02/05/2010	56.77308	-7.15031	56.77132	-7.14936	101	123	9:48:28	10:08:10	ovrh_02.5.10(1)
Mingulay	T17	02/05/2010	56.77132	-7.14936	56.77028	-7.14926	123	140	10:08:10	10:17:30	ovrh_02.5.10(1)
Mingulay	T18	02/05/2010	56.77673	-7.23195	56.77213	-7.23648	145	135	11:35:20	12:05:00	ovrh_02.5.10(1)
Mingulay	T19	02/05/2010	56.77363	-7.22227	56.77052	-7.22685	96	94	12:23:30	12:52:40	ovrh_02.5.10(1)

Appendix 1 continued

Location	Site ID	Date	Start latitude	Start longitude	End latitude	End longitude	Depth start (m)	Depth end (m)	Time start (hh:mm:ss)	Time end (hh:mm:ss)	DVD reference no.
Mingulay	T20	02/05/2010	56.76980	-7.22768	56.76581	-7.22650	88	101	13:01:06	13:47:10	ovrh_02.5.10(2)
Mingulay	T20	02/05/2010	56.76581	-7.22650	56.76535	-7.22594	101	102	13:47:10	13:53:00	ovrh_02.5.10(2)
Mingulay	T20	02/05/2010	56.76535	-7.22594	56.76507	-7.22566	102	102	13:53:00	13:56:00	ovrh_02.5.10(2)
Mingulay	T20	02/05/2010	56.76507	-7.22566	56.76300	-7.22638	102	105	13:56:00	14:10:19	ovrh_02.5.10(2)
Mingulay	T21	02/05/2010	56.72215	-7.20225	56.72118	-7.20064	104	156	14:50:29	14:58:19	ovrh_02.5.10(2)
Mingulay	T21	02/05/2010	56.72118	-7.20064	56.71901	-7.19595	156	151	14:58:19	15:15:04	ovrh_02.5.10(2)
Mingulay	T22	03/05/2010	56.68652	-7.26347	56.68338	-7.27906	99	123	10:16:20	11:21:20	ovrh_03.5.10(1)
Mingulay	T23	03/05/2010	56.77188	-7.36451	56.76966	-7.36676	156	155	12:32:44	12:42:20	ovrh_03.5.10(2)
Mingulay	T23	03/05/2010	56.76966	-7.36676	56.76441	-7.37140	155	146	12:42:20	13:02:15	ovrh_03.5.10(2)
Mingulay	T24	03/05/2010	56.78888	-7.35062	56.78712	-7.35071	137	118	13:30:44	13:39:22	ovrh_03.5.10(2)
Mingulay	T24	03/05/2010	56.78712	-7.35071	56.78482	-7.35119	118	112	13:39:22	13:50:42	ovrh_03.5.10(2)
Mingulay	T24	03/05/2010	56.78482	-7.35119	56.78399	-7.35137	112	112	13:50:42	13:55:04	ovrh_03.5.10(2)
Mingulay	T25	03/05/2010	56.79482	-7.35478	56.79158	-7.35497	183	161	14:12:54	14:25:53	ovrh_03.5.10(2)
Mingulay	T25	03/05/2010	56.79158	-7.35497	56.78993	-7.35483	161	150	14:25:53	14:32:40	ovrh_03.5.10(2)
Mingulay	T26	03/05/2010	56.82624	-7.39375	56.82636	-7.39333	163	166	17:25:23	17:27:30	ovrh_03.5.10(3)
Mingulay	T26	03/05/2010	56.82636	-7.39333	56.82562	-7.38269	166	162	17:27:30	17:55:44	ovrh_03.5.10(3)

Appendix 2 Physical and biological descriptions of the survey sites. Site ID codes correspond with those in Appendix 1. PMF codes used are as follows: habitats - BM (burrowed mud), CR (cold-water coral reef), DS (deep sponge community), HM (horse mussel bed), KS (kelp and seaweed community on sublittoral sediment), TS (tide-swept algal community); species - AF (*Atrina fragilis*), FQ (*Funiculina quadrangularis*), LC (*Leptometra celtica*), MM (*Molva molva*), PA (*Parazoanthus anguicomus*), PM (*Pachycerianthus multiplicatus*), SE (*Ammodytes* spp.), SP (*Swiftia pallida*)

Site ID	Substrate	Biota	Biotope	PMF	Comments
FITV37	Areas of bedrock with shell gravel pockets and small boulders on shell gravel	BIota dominated by dense carpets of *Corynactis viridis* (C, locally A) and *Alcyonium digitatum* (C, locally A). The rock also supports encrustations of *Balanus crenatus*? (O) and pink coralline algae (F), with fairly dense *Echinus esculentus* (C) and sparse sponges including *Myxilla incrustans* (R), hydroid clumps (R), *Flustra foliacea* (R), *Caryophyllia smithii* (P), *Cancer pagurus* (P), foliose red algae (R), *Asterias rubens* (P) and *Henricia* sp. (F)	CR.HCR.XFa.CvirCri		Not a close biotope fit due to the absence of a bryozoan turf
FITV38	Low-lying, sand-scoured bedrock, with much of it covered by rippled fine-medium sand	The rock supports a low-diversity fauna dominated by erect bryozoans. Over the run as a whole *Flustra foliacea* is common and *Alcyonidium diaphanum* frequent but *Flustra* is superabundant in places and *Alcyonidium* abundant. The latter species is particularly characteristic of areas with a cover of sand, where the colonies are very long. In the more sand-affected areas there are patches of *Tubularia indivisa*? (P) and occasional *Urticina felina*. *Alcyonium digitatum* is generally rare but becomes frequent on slightly elevated rock surfaces, where *Flustra* is often profuse and crusts of orange bryozoans (R) and *Spirobranchus* spp. (F) are also found. *Munida sarsi* (O), *Echinus esculentus* (C), *Crossaster papposus* (R), *Securiflustra securifrons*? (P)	CR.MCR.EcCr.FaAlCr.Flu SS.SSa.CFiSa		Lack of infaunal data renders the sediment biotope identity uncertain but the likely depth and extent of sediment in places justifies the recognition of both rock and sediment biotopes
FITV39	Heterogeneous coarse sediment of shell and stone gravel with shells	Low-diversity epifauna dominated by profuse development of *Alcyonidium diaphanum* (A, locally S) with colonies attaining lengths of around 50 cm	SS.SCS.CCS		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
FITV40	Heterogeneous coarse sediment of shell and stone gravel with shells	Low-diversity epifauna dominated by dense *Alcyonidium diaphanum* (C) with sparse additional fauna including *Flustra foliacea* (R), *Asterias rubens* (R), *Croassaster papposus* (R) and *Raja naevus* (R)	SS.SCS.CCS		
FITV41	Initially rippled medium? sand becoming sandy gravel (at least superficially)	Initially scattered colonies of *Alcyonidium diaphanum* (R) which increase in density throughout the run, becoming abundant (overall F). *Pagurus bernhardus* (R), Asteroidea spp. indet (O), *Raja montagui* (P), *Raja naevus* (P)	SS.SCS.CCS		
FITV42	Rippled fine-medium sand	Little surface evidence of biota. *Alcyonidium diaphanum* (R), *Pagurus bernhardus* (R)	SS.SSa.CFiSa		Lack of infaunal data renders the biotope identity uncertain
FITV43	Rippled fine-medium sand	Little surface evidence of biota. *Alcyonidium diaphanum* (R, but probably drift), Asteroidea spp. indet (O)	SS.SSa.CFiSa		Lack of infaunal data renders the biotope identity uncertain
FITV44	Rippled fine-medium sand	Little surface evidence of biota. *Alcyonidium diaphanum* (R, drift), *Flustra foliacea* (R, drift), Asteroidea spp. indet (O), Pleuronectidae sp. (P)	SS.SSa.CFiSa		Lack of infaunal data renders the biotope identity uncertain
FITV45	Dense cobbles and small boulders on medium-coarse sand	Stones support dense *Spirobranchus* spp. (A) and *Alcyonium digitatum* (C, locally A). Large numbers of ophiuroids (mainly *Ophiocomina nigra*, A) are present on the rock and sediment, although they are fairly sparse in some areas. *Crossaster papposus* (O), *Hippasteria phrygiana* (R), *Echinus esculentus* (C), *Flustra foliacea* (R), *Munida sarsi* (O), *Cancer pagurus* (R)	CR.MCR.EcCr.FaAlCr.Adig CR.MCR.EcCr.FaAlCr.Bri		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
WMO21	Fissured bedrock with sand-dusted patches and boulders on medium sand	Mostly bare-looking rock encrusted with pink coralline algae (C) and orange bryozoans (R) but with patches of *Alcyonium digitatum* (locally C) and sparse *Cliona celata*. Motile forms include *Ophiocomina nigra* (R but locally A), Asteroidea spp. indet (F), *Echinus esculentus* (C) and *Molva molva* (P). *Caryophyllia smithii* (R), *Calliostoma zizyphinum* (R)	CR.MCR.EcCr.FaAlCr	MM	
WMO22	Boulders (predominantly small) and cobbles on gravelly sand, interrupted by occasional small sand patches	Stones encrusted with *Spirobranchus* spp. (C), orange bryozoans (F - probably largely *Parasmittina trispinosa*) and pink coralline algae (F). Erect forms include frequent *Caryophyllia smithii* (locally C), *Ascidia mentula*? (R) and *Omalosecosa ramulosa*? (R), while motile species include Labridae sp. (P), *Molva molva* (P), *Calliostoma zizyphinum* (R), *Echinus esculentus* (C), Asteroidea (F) including *Stichastrella rosea* (P) and *Crossaster papposus* (P)	CR.MCR.EcCr.FaAlCr.Car	MM	
WMO23	Varying densities of cobbles, boulders and pebbles on medium sand, with some areas of predominantly sand	Stones encrusted with *Spirobranchus* spp. (C), other serpulid worms (P), pink coralline algae (O) and orange bryozoans (R). Rock also supports *Caryophyllia smithii* (C), *Echinus esculentus* (C) and sparse *Flustra foliacea* (R), *Alcyonium digitatum* (R) and *Calliostoma zizyphinum* (P). Sandy areas show little evidence of infaunal or epifaunal life	CR.MCR.EcCr.FaAlCr.Car SS.SSa.CFiSa		Absence of community data for the sedimentary areas makes biotope identification uncertain
WMO24	Stepped rock platforms and ledges with sand accumulating on upper faces and in channels	Rock generally sparsely encrusted with *Spirobranchus* spp. (F), pink coralline algae (F) and orange bryozoans (R) and supporting scattered *Alcyonium digitatum* (O), although dense stands are present on some steep faces (A). Sand-influenced areas often support dense patches of *Flustra foliacea* (locally A). *Echinus esculentus* (C), *Asterias rubens* (O), Asteroidea spp. indet (P), *Cliona celata*? (R), *Porania pulvillus* (R), *Labrus bimaculatus* (P)	CR.MCR.EcCr.FaAlCr CR.MCR.EcCr.FaAlCr.Flu CR.MCR.EcCr.FaAlCr.Pom		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
WMO24	Rock platforms	Park of *Laminaria hyperborea* (C, locally A but small plants). Rock generally sparsely encrusted with *Spirobranchus* spp. (P) and pink coralline algae (F) and supporting an algal turf of *Dictyota dichotoma* (C) and foliose and filamentous reds (C), including *Callophyllis laciniata* (P). *Alcyonium digitatum* (F), *Echinus esculentus* (C), *Luidia cilairis* (F)	IR.MIR.KR.Lhyp.Pk		
WMO24	Rock platforms	Rock generally sparsely encrusted with *Spirobranchus* spp. (P), pink coralline algae (O) and red algae (R) and supporting *Alcyonium digitatum* (locally F), *Dictyota dichotoma* (F in shallower water) and sparse foliose red algae (R). *Echinus esculentus* (F), *Luidia ciliaris* (O), *Marthasterias glacialis* (P), *Asterias rubens* (P)	CR.MCR.EcCr.FaAlCr		
WMO25	Slightly rippled fine sand	Little evidence of life apart from 1 Pleuronectidae sp.	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
WMO26	Slightly rippled fine sand	Little evidence of life apart from some possible small bivalve siphons (O)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
WMO27	Stepped bedrock ledges and platforms	Forest of *Laminaria hyperborea* (A) with red algal understorey (C) including *Delesseria sanguinea* (P) and *Callophyllis laciniata* (P). Rock encrusted with pink coralline algae (F) and supporting *Alcyonium digitatum* (F, becoming A locally on vertical faces). *Echinus esculentus* (F), *Asterias rubens* (P), *Luidia ciliaris* (P)	IR.MIR.KR.Lhyp.Ft		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
WMO27	Stepped bedrock ledges and platforms	Park of *Laminaria hyperborea* (F) with patchy algal turf of *Dictyota dichotoma* (C) and *Callophyllis laciniata* (R). Rock encrusted with pink coralline (O) and red (P) algae, orange bryozoans (R) and supporting *Alcyonium digitatum* (O, becoming A locally on short, vertical faces). *Echinus esculentus* (C), *Asterias rubens* (P), *Luidia ciliaris* (F), *Marthasterias glacialis* (F), *Cliona celata*? (R)	IR.MIR.KR.Lhyp.Pk		
WMO28	Stepped bedrock but with some extensive vertical walls and gullies (containing boulders and sand) creating uneven topography	*Laminaria hyperborea* (A) forest on shallower, upward-facing surfaces, and park (C) on deeper upper surfaces. The rock is encrusted with pink coralline algae (C) and brown algae (P) and supports an algal turf dominated by *Dictyota dichotoma* (C) in the park and, seemingly, red algae (C) in the forest. *Echinus esculentus* (C), *Luidia ciliaris* (F). *Alcyonium digitatum* is scattered throughout the forest and park (O), but forms dense fields (S) on vertical faces, some very extensive	IR.MIR.KR.Lhyp.Ft IR.MIR.KR.Lhyp.Pk CR.MCR.EcCr.FaAlCr.Adig		The *Alcyonium* biotope could also be AdigVt but too little detail is observable
WMO28	Stepped bedrock with sand and boulder-filled gullies, becoming less uneven in the latter half of the run	Rock encrusted with pink coralline (F) and red (R) algae, orange bryozoans (O) and sparse serpulid worms (F). *Acyonium digitatum* is generally occasional but becomes superabundant on vertical faces, some extensive. *Dictyota dichotoma* is common on the most elevated rock surfaces, whilst *Flustra foliacea* forms dense fields (locally S) in some gullies and other sand-influenced rock surfaces. *Clione celata* (R), *Echinus esculentus* (F), *Luidia ciliaris* (F), *Crossaster papposus* (O), Asteroidea spp. indet (P), *Marthasterias glacialis* (P), *Urticina* spp. (P)	CR.MCR.EcCr.FaAlCr CR.MCR.EcCr.FaAlCr.Adig CR.MCR.EcCr.FaAlCr.Flu		The *Alcyonium* biotope could also be AdigVt but too little detail is observable

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
WMO29	Low-profile, sand-scoured bedrock and boulders with sand pockets	Rock encrusted with pink coralline algae (O), orange (O) and red (R) bryozoans and *Spirobranchus* spp. (C), and supporting scattered patches of *Flustra foliacea* (R overall, but dense locally) and *Securiflustra securifrons*? (P). *Acyonium digitatum* (O), *Urticina* spp. (O), *Caryophyllia smithii* (C locally), *Polymastia boletiformis* (R), *Echinus esculentus* (C), *Luidia ciliaris* (P), Gobiidae sp.? (P)	CR.MCR.EcCr.FaAlCr.Flu		
WMO30	Low-profile, sand-scoured bedrock with sand pockets	Rock encrusted with pink coralline algae (O), *Parasmittina trispinosa* (O) and red (R) bryozoans and *Spirobranchus* spp. (C), and supporting scattered patches of *Flustra foliacea* (R overall, but dense locally) and *Securiflustra securifrons*? (P). *Alcyonium digitatum* (F), *Urticina* spp. (P), *Echinus esculentus* (C), *Luidia ciliaris* (P), *Crossaster papposus* (O), *Henricia* sp. (R), *Marthasterias glacialis* (O), *Calliostoma zizyphinum* (P), *Cliona celata* (R), *Myxilla incrustans*? (R), *Munida sarsi* (R)	CR.MCR.EcCr.FaAlCr.Flu		
WMO31	Low-profile, sand-scoured bedrock and boulders with sand pockets	Parts of the rock are encrusted with pink coralline algae (F) , orange (R) and red (R) bryozoans and serpulid worms (C), including *Spirobranchus* spp. (F), but extensive areas are covered by a bryozoan turf of *Flustra foliacea* (F) and a short crisiid-like sand-trapping form (A). Other sessile forms include *Caryophyllia smithii* (locally C), *Alcyonium digitatum* (R), and the sponges, *Haliclona urceolus*? (R) and a yellow encrusting species (R). *Echinus esculentus* (C), *Luidia ciliaris* (F), *Porania pulvillus* (R), *Crossaster papposus* (P), Asteroidea spp. indet (O), *Cancer pagurus* (P), *Labrus bimaculatus* (O), *Calliostoma zizyphinum* (P)	CR.MCR.EcCr.FaAlCr.Flu		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
WMO32	Low-profile sand-scoured bedrock platforms and boulders on coarse sand with sand patches; one extensive patch of coarse sand/shell gravel waves	Parts of the rock are encrusted with pink coralline (F) and red (R) algae, orange bryozoans (O), *Spirobranchus* spp. (F) and *Balanus* spp. (P), but extensive areas are covered by a bryozoan turf of *Flustra foliacea* (F, locally A) and *Securiflustra securifrons* (P) and a short crisiid-like sand-trapping form (A, S locally). Other sessile forms include *Caryophyllia smithii* (P), *Alcyonium digitatum* (O), *Polymastia boletiformis* (R), *Nemertesia antennina* (R), *Urticina* spp. (P). For much of the run the rocks support dense *Ophiocomina nigra* (A). Other motile forms include *Echinus esculentus* (F), *Luidia ciliaris* (F), *Porania pulvillus* (R), *Crossaster papposus* (P), *Asterias rubens* (P), *Cancer pagurus* (F), *Labrus bimaculatus* (O), *Calliostoma zizyphinum* (P)	CR.MCR.EcCr.FaAlCr.Flu CR.MCR.EcCr.FaAlCr.Bri SS.SCS.CCS		The richness of the bryozoan fauna places this site also close to CR.HCR.XFa biotopes
WMO33	Slightly rippled fine sand	Much algal debris but little sign of living biota apart from initial glimpse of small shoal of fish (possibly *Ammodytes* sp.) disturbed by the camera flash	SS.SSa.CFiSa	SE?	Lack of infaunal and particle size data renders the biotope identity uncertain
WMO34	A scatter of small boulders, cobbles, pebbles and gravel on fine-medium sand	Larger stones encrusted with serpulid worms (C-A) and supporting *Caryophyllia smithii* (C locally), *Urticina* spp. (F) and sparse hydroid patches (O), including *Nemertesia antennina*? (P). *Echinus esculentus* (P)	CR.MCR.EcCr.FaAlCr.Flu		
WMO34	Fine sand	Little firm evidence of life, apart from Asteroidea spp. indet (O), Teleostei sp. (P) and possible sparse siphons and *Lanice* tubes	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
WMO35	Fine sand	Evidence of infaunal life includes *Myxicola infundibulum* (P) and polychaete casts (P), while epifauna includes *Pleuronectes platessa* (F), Gobiidae sp.? (P), *Luidia ciliaris* (P) and Asteroidea sp. indet (P)	SS.SSa.CFiSa		Lack of infaunal data renders the biotope identity uncertain

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
WMO36	Waves of medium-coarse sand with cobbles, pebbles and shell material in the troughs	Stones encrusted with serpulid worms (probably largely dead)	SS.SCS.CCS		
WMO36	Fine sand	Frequent small faecal mounds, possibly due to *Antalis entalis*, which is present. Also sparse polychaete casts, siphons, and possibly small burrows. *Raja* sp. (P)	SS.SSa.CFiSa		Lack of infaunal data renders the biotope identity uncertain
WMO37	Highly heterogeneous substrate of varying proportions of gravel, pebbles, cobbles and boulders on slightly silty sand, but with some areas of dense boulders and cobbles and one patch of fine sand	Larger stones encrusted with serpulid worms, but most appear dead, although live *Serpula vermicularis* is present. Other sessile forms include sparse encrusting orange bryozoans (R), *Omalosecosa ramulosa*? (C on boulders), *Flustra foliacea* (R), *Urticina* spp.? (R) and *Caryophyllia smithii* (O), with *Lanice conchilega* (O) in the sediment between stones and *Cerianthus lloydii*? (R) in the fine sand patch. Motile species include *Echinus esculentus* (F), *Luidia ciliaris* (F), *Asterias rubens* (P), Asteroidea spp. indet (F), *Porania pulvillus* (R), *Munida sarsi* (P), *Cancer pagurus* (P), *Labrus bimaculatus* (P)	SS.SMx.CMx CR.MCR.EcCr.FaAlCr SS.SSa.CFiSa		
WMO38	Fine sand	Sediment with c. 10 cm diameter low mounds topped with polychaete-type cast (C) and *Luidia ciliaris* (P). Small fish shoal	SS.SSa.CFiSa		
WMO38	A band of gravel, pebbles and mostly dense cobbles and boulders	Stones with very impoverished community consisting of abundant serpulid worm tubes (possibly dead) and sparse orange bryozoans (R). *Flustra foliacea* present but probably drift material. *Echinus esculentus* (P), *Luidia ciliaris* (P)	CR.MCR.EcCr.FaAlCr		
WMO38	Fine sand	Little identifiable evidence of life. *Luidia ciliaris* (P)	SS.SSa.CFiSa		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
WMO39	Highly heterogeneous substrate of varying proportions of gravel, pebbles, cobbles and boulders on sand, but with some areas of dense boulders and cobbles	Larger stones encrusted with serpulid worms, including *Spirobranchus* spp. (C-A) and orange bryozoans (R) and supporting *Omalosecosa ramulosa*? (P), *Urticina* spp. (R), hydroids (R), *Cliona celata*? (R), small *Alcyonium digitatum* (R) and *Caryophyllia smithii* (P). *Echinus esculentus* (C), *Luidia ciliaris* (F), Asteroidea spp. indet (F - probably *Asterias rubens*), *Munida sarsi* (P)	SS.SMx.CMx CR.MCR.EcCr.FaAlCr		
WMO40	Waves of coarse sand with gravel, pebbles and shell in the troughs, interrupted by stone bands, which vary in composition from predominantly dense boulders and cobbles to predominantly small cobbles, pebbles and gravel on sand	Larger stones densely encrusted with serpulid worms (A) and with sparse orange bryozoan crusts (R), with patches of the largest boulders also supporting dense *Caryophyllia smithii*. *Echinus esculentus* (F, locally C), *Asterias rubens* (P), Asteroidea spp. indet (O), *Luidia ciliaris* (F), *Calliostoma zizyphinum* (P), Axinellidae sp.? (R)	SS.SMx.CMx CR.MCR.EcCr.FaAlCr CR.MCR.EcCr.FaAlCr.Car SS.SCS.CCS		Areas of smaller cobbles and pebbles are also close to SS.SCS.CCS.PomB
WMO41	Patchy cover of boulders and cobbles on coarse sand	Cobbles and boulders densely encrusted with serpulid worms (A) and *Caryophyllia smithii* (A) and also with crusts of *Parasmittina trispinosa* (O) and pink coralline algae (R) and sparse patches of a thin hydroid turf (R). *Echinus esculentus* (F), Asteroidea spp. indet (F), *Ophiura* sp. (R), *Porania pulvillus*? (P)	CR.MCR.EcCr.FaAlCr.Car SS.SCS.CCS		
WMO43	Dense boulders and cobbles on coarse sand with gravel and pebbles	Rock encrusted with serpulid worms (C), *Parasmittina trispinosa* (F), red bryozoans (R) and pink coralline algae (R), and supporting dense *Caryophyllia smithii* (C, locally A) and *Omalosecosa ramulosa*? (C). Other sessile forms include *Balanus balanus*? (R), patches of a thin hydroid turf (R), *Ascidia mentula*? (P), *Chaetopterus variopedatus* (F) and Porifera sp. (R). The motile epifauna includes *Echinus esculentus* (C), Asteroidea spp. indet (C), *Porania pulvillus* (C), *Munida sarsi* (P), *Necora puber* (P), Labridae spp. (P), *Gibbula cineraria* (P)	CR.MCR.EcCr.FaAlCr.Car		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
WMO44	Dense boulders and cobbles on coarse sand with gravel and pebbles	Rock encrusted with serpulid worms (C) including *Spirobranchus* spp. (P), *Parasmittina trispinosa* (F), red (R) and ochre (R) bryozoans and pink coralline algae (R), and supporting dense *Caryophyllia smithii* (C, locally A). *Flustra foliacea* is frequent over extensive areas, in association with *Securiflustra securifrons* (P). Other sessile forms include sparse hydroids (R), including *Thuiaria thuja*, *Ascidia mentula*? (P), *Chaetopterus variopedatus* (F), *Omalosecosa ramulosa*? (P), balls of *Filograna implexa*? (R) and *Urticina* spp. (R). The motile epifauna includes *Echinus esculentus* (C), *Asterias rubens* (P), *Luidia ciliaris* (P), Asteroidea spp. indet (F), *Porania pulvillus* (O), *Munida sarsi* (P), *Calliostoma zizyphinum* (P) and *Aequipecten opercularis* (P)	CR.MCR.EcCr.FaAlCr.Car CR.MCR.EcCr.FaAlCr.Flu		
WMO45	Scattered cobbles and boulders on coarse sand with gravel and pebbles	Rock encrusted with serpulid worms (A) including *Spirobranchus* spp. (P), *Parasmittina trispinosa* (O) and red bryozoans (R), and supporting clumps of *Flustra foliacea* (O, locally F) and *Securiflustra securifrons* (P). Other sessile forms include sparse hydroids (R), *Ascidia mentula*? (P), *Ascidia virginea*? (P), *Chaetopterus variopedatus* (F), *Porella compressa* (P), *Omalosecosa ramulosa*? (P), *Filograna implexa*? (R) and *Urticina* spp. (R). The motile epifauna includes *Echinus esculentus* (F), *Luidia ciliaris* (P), Asteroidea spp. indet (F), *Munida sarsi* (P), *Calliostoma zizyphinum* (P), *Aequipecten opercularis* (P), *Pecten maximus* (P), *Callionymus lyra* (P), Pleuronectiformes sp. (P) and *Labrus bimaculatus* (P)	CR.MCR.EcCr.FaAlCr.Flu		The biotope is also close to SS.SMx.CMx.FluHyd

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
WMO46	Predominant substrate is coarse sand with much gravel and pebble surface material and scattered cobbles, but small patches of boulders also present. In places at least, it appears that the sediment may be a thin veneer over extensive rock	Larger stones encrusted with serpulid worms (A) and *Parasmittina trispinosa* (O), and supporting *Caryophyllia smithii* (F, locally C), clumps of *Flustra foliacea* (O), *Securiflustra securifrons* (P), *Polymastia boletiformis* (R, locally F) and sparse hydroids (R) and *Alcyonium digitatum* (R). *Urticina* spp. (O), Cirripedia spp. (R), *Munida sarsi* (O), *Cancer pagurus* (P), *Luidia ciliaris* (F), *Porania pulvillus* (R), *Henricia* sp. (R), *Myxicola infundibulum*? (R), Prosobranchia sp. (P)	SS.SMx.CMx.FluHyd CR.MCR.EcCr.FaAlCr.Flu		Impoverished bryozoan and hydroid faunas for FluHyd
NW3	Dense boulders and cobbles with shell gravel infill, with small patches of coarse sediment and bedrock outcrops	Rock surfaces encrusted with pink coralline algae (C), barnacles (F) (probably largely *Balanus crenatus*), red bryozoans (O), *Botryllus schlosseri* (R) and a variety of sponges, including sheet-like cream forms (R), as well as cream (R) and yellow (O) cushions. The erect community comprises patches of *Tubularia indivisa* (O), *Alcyonium digitatum* (O) and *Flustra foliacea* (R) in the more sediment scoured areas. *Echinus esculentus* (C), *Calliostoma zizyphinum* (O), *Cancer pagurus* (P), *Asterias rubens* (P)	CR.HCR.FaT.CTub		Chart shows current reaches 5.1 kt
SR10	Shelly fine sand with scattered shells	Shells provide support for scattered tufts (F), which include hydroids and possibly other sessile forms, but lack of photos prevents more detailed identification. *Luidia cilairis* (P), *Porania pulvillus* (R), *Echinus esculentus* (P), Asteroidea sp. indet (P)	SS.SMx.CMx.FluHyd		Highly uncertain biotope identity due to poor image quality
SR11	Rippled fine sand with scattered shells	Scatter of drift material only	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SR12	Rippled fine sand	Sparse drift material, *Pleuronectes platessa* (P), spatangid test (P), Asteroidea sp. (P)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR13	Shelly fine-medium sand with scattered shells, cobbles, boulders and outcropping bedrock	Rock encrusted with *Spirobranchus* spp. (A) and orange bryozoans (R) and supporting hydroid patches (F), including *Nemertesia ramosa* (P), *Alcyonium digitatum* (R) and *Flustra foliacea* (P). Hydroids and *Flustra* are also scattered over the sediment, some of which is possibly attached to shells and stones, some may be loose. *Echinus esculentus* (F), *Munida sarsi* (O), *Cancer pagurus* (P)	SS.SMx.CMx.FluHyd		
SR14	Rippled fine sand with widely scattered cobbles and boulders	Little evidence of life on the sediment, apart from drift material, especially kelp and other algae. The sparse stones are encrusted with *Spirobranchus* spp. (C) and provide a substrate for *Echinus esculentus* (F) and *Flustra foliacea* (R). *Asterias rubens* (P)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR15	Rippled fine sand	No biota observed apart from Paguridae sp. (R)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR16	Rippled fine sand	No biota observed	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR17	Rippled fine sand	Drift material and sparse *Flustra foliacea* (R), which may also be drift	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SR18	Slightly rippled fine sand with scattered shells	Much drift material but no living biota observed	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR19	Shelly medium sand, initially with scattered cobbles and boulders	Stones encrusted with *Spirobranchus* spp. (C) and *Parasmittina trispinosa* (R). *Echinus esculentus* (C) in the vicinity of stones. *Luidia cilaris* (P), *Aequipecten opercularis* (R)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR20	Medium sand with scattered shells	Much drift material and *Ensis* shells. *Callionymus lyra* (P), *Crossaster papposus* (P), Brachyura sp. (R)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR21	Heterogeneous substrate of medium sand with gravel, pebbles and shells and scattered cobbles and boulders	Stones encrusted with *Spirobranchus* spp. (C) and orange bryozoans (R) and supporting sparse hydroid tufts (R) and *Flustra foliacea* (R, locally F). *Echinus esculentus* (F), *Luidia cilaris* (O), *Crossaster papposus* (P), *Munida sarsi* (R), *Cancer pagurus* (P), Asteroidea sp. indet (R)	SS.SMx.CMx.FluHyd		Not a close biotope fit
SR22	Low-profile, sand-scoured bedrock and boulders with extensive sand-dusting of the bedrock	Rock encrusted with *Spirobranchus* spp. (C), pink coralline algae (R) and orange bryozoans (R) and supporting scattered and apparently attached kelp plants (*Saccorhiza polyschides* and *Saccharina latissima*), as well as frequent *Alcyonium digitatum* and *Nemertesia antennina* (P). *Echinus esculentus* (C), *Ophiura albida* (at least locally common)	IR.HIR.KSed.LsacSac		Some doubt concerning the attachment of the kelp plants

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SR24	Mix of sand, gravel, pebbles and Modiolus shells, with occasional boulders	More or less continuous sheet of superabundant *Modiolus modiolus* with a cover of superabundant *Ophiothrix fragilis*. Very dense predator populations with high numbers of large *Asterias rubens* (C) and *Echinus esculentus* (A). *Crosaster papposus* (F), *Cancer pagurus* (O), *Pagurus bernhardus* (P), Brachyura sp. (P), *Urticina* spp. (P), *Alcyonium digitatum* (O)	SS.SBR.SMus.ModT	HM	
SR25	Rippled fine sand with sparsely scattered shells	Evidence of infaunal life includes low mounds, c.10 cm in diameter topped by polychaete-like cast (F), terebellid tentacles (F), siphons (P), and sabellid tentacle crowns (F). Epifauna includes *Liocarcinus depurator* (R) and Asteroidea sp. indet (P)	SS.SSa.CFiSa		Lack of detailed infaunal and particle size data renders the biotope identity uncertain
SR26	Rippled fine sand	Little surface evidence of life apart from *Ophiura ophiura* (P) and *Luidia ciliaris* (P)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR27	Rippled fine sand with scattered shells	Sparse evidence of life. *Pecten maximus* (R), *Cerianthus lloydii* (R), *Liocarcinus* sp. (R), *Cancer pagurus* (P), Pisces sp. (R)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR27	Bedrock outcrop	Bare-looking rock with sparse orange bryozoan crust (R). *Echinus esculentus* (C), *Metridium senile* (R)	CR.MCR.EcCr.FaAlCr		
SR27	Fine sand with scattered shells	*Cerianthus lloydii* (R), *Lanice conchilega*? (P)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SR28	Rippled fine sand interrupted by stone bands (cobbles and boulders with pebbles and gravel)	Sand areas with *Ophiura ophiura* (P) and possibly *Lanice conchilega* (locally F) and *Ammodytes* sp. (P). *Asterias rubens* (P). Larger stones encrusted with sepulid worms (F), *Balanus* spp. (R), *Parasmittina trispinosa* (R) and pink coralline algae (R) and supporting *Alcyonium digitatum* (R), *Gibbula* sp. (F), *Echinus esculentus* (C) and *Cancer pagurus* (F)	SS.SSa.CFiSa CR.MCR.EcCr.FaAlCr	SE?	Lack of infaunal and particle size data renders the sediment biotope identity uncertain
SR29	Slightly rippled fine sand	Small *Lanice conchilega*? (C). Solenidae spp. shells on sand surface	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR30	Rippled fine sand	Infauna includes *Ceriathus lloydii* (F) and *Lanice conchilega*? (C) with Solenidae spp. shells on the sediment surface. Epifauna includes *Liocarcinus depurator* (R) and *Asterias rubens* (O)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
SR31	Sand-scoured bedrock, with sand pockets	Bare-looking rock with sparse encrustations of pink coralline algae (O), orange bryozoans (R) and serpulid worms (F) but with *Ophiothrix fragilis* and *Ophiura albida* both common, at least locally. *Echinus esculentus* (C), *Asterias rubens* (F), *Crossaster papposus* (P), *Alcyonium digitatum* (R)	CR.MCR.EcCr.FaAlCr		
SR31	Waves of shelly medium sand with dense shell material in the troughs	The only sand biota observed was *Asterias rubens* (P)	SS.SCS.CCS		Lack of infaunal and particle size data renders the biotope identity uncertain
SF4	Muddy sand with broken and whole shells and gravel and brown surface film	Occasional small patches of *Phyllophora crispa* (O) and numerous mounds of 5-15 cm diameter. Shells sparsely encrusted with serpulid worms. *Asterias rubens* (C), *Liocarcinus depurator* (F)	SS.SMx.CMx		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SF5	Muddy sand with broken and whole shells, gravel, pebbles and scattered cobbles, and flocculent brown surface layer	Patchy *Phyllophora crispa* (F) with some extensive patches of dense cover (S). Mounds apparently present though visibility poor. Cobbles sparsely encrusted with serpulid worms. *Asterias rubens* (O), *Liocarcinus depurator* (R)	SS.SMx.CMx SS.SMp.KSwSS.Pcri	KS	
SF6	Muddy sand with broken and whole shells, gravel, pebbles and scattered cobbles, and flocculent brown surface layer	Patchy *Phyllophora crispa* (F) with some extensive patches of dense cover (S). Mounds apparently present though visibility poor. Cobbles sparsely encrusted with serpulid worms. *Asterias rubens* (O)	SS.SMx.CMx SS.SMp.KSwSS.Pcri	KS	
SF7	Muddy sand with gravel, pebbles and broken and whole shells and scattered cobbles and flocculent brown surface layer	Extensive areas of dense *Phyllophora crispa* (A), although overall only frequent. Cobbles sparsely encrusted with serpulid worms. Mounds present. *Asterias rubens* (F), *Liocarcinus depurator* (R), *Aequipecten opercularis* (R)	SS.SMx.CMx SS.SMp.KSwSS.Pcri	KS	
SF8	Muddy sand with gravel, pebbles and broken and whole shells (locally dense) and scattered cobbles and flocculent brown surface layer	Scattered small patches of *Phyllophora crispa* (O). Mounds present. Stones sparsely encrusted with serpulid worms. *Asterias rubens* (C), *Liocarcinus depurator* (O)	SS.SMx.CMx		
SF9	Muddy sand with pebbles (locally dense), gravel, shell material and occasional cobbles and boulders, and a brown surface film	Stones encrusted with pink coralline algae (A) and serpulid worms (P). Scattered patches of *Phyllophora crispa* (O), locallly abundant, particularly in association with dense pebbles. *Asterias rubens* (F), *Liocarcinus depurator* (O), *Aequipecten opercularis* (R), *Echinus esculentus* (P), *Crossaster papposus* (P)	SS.SMx.CMx SS.SMp.KSwSS.Pcri	KS	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SF10	Mixed muddy sand sediment with gravel, pebbles and shell (including many Modiolus modiolus) and flocculent brown surface layer	Stones lightly encrusted with pink coralline algae and serpulid worms. Brachyura sp. (P), *Asterias rubens* (F), *Cerianthus lloydii* (F)	SS.SMx.CMx		
SF12	Mixed muddy sediment with cover of coarse material including gravel, pebbles and shells, but visibility very poor due to presence of flocculent brown surface layer	*Asterias rubens* (F)	SS.SMx.CMx		
SF13	Mixed muddy sand sediment with gravel and sparse pebbles, shell and cobbles and flocculent brown surface layer	Cobbles encrusted with serpulid worms. *Asterias rubens* (F), *Cerianthus lloydii*? (P)	SS.SMx.CMx		
SF14	Mixed muddy sand sediment with gravel and scattered pebbles, cobbles and shell and flocculent brown surface layer	Sediment with patchy cover of *Phyllophora crispa* (A) and numerous mounds 5-25 cm in diameter. *Asterias rubens* (F)	SS.SMp.KSwSS.Pcri	KS	
SF15	Mixed muddy sand sediment with gravel and scattered pebbles and shell and flocculent brown surface layer	Sediment with occasional patches of *Phyllophora crispa* (O), numerous mounds 5-25 cm in diameter and *Cerianthus lloydii*? (F). *Asterias rubens* (F), *Liocarcinus depurator* (R)	SS.SMx.CMx		
SF16	Muddy sand with surface scatter of gravel and shell and brown surface film (possibly diatomaceous)	Sediment with scattered patches of *Phyllophora crispa* (F), numerous mounds and *Cerianthus lloydii*? (P). *Asterias rubens* (O), *Liocarcinus depurator* (F)	SS.SMx.CMx		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SF17	Muddy sand with much superficial broken shell material and whole shells (especially Modiolus modiolus) and brown surface film	Shells sparsely encrusted with serpulid worms. *Asterias rubens* (C), *Liocarcinus depurator* (F), *Modiolus modiolus* (F)	SS.SMx.CMx		
SF18	Muddy sand with much superficial broken shell material and whole shells and brown surface film	Sediment with scattered patches of *Phyllophora crispa* (F) and numerous mounds of 5-20 cm diameter. Shells sparsely encrusted with serpulid worms. *Asterias rubens* (C), *Liocarcinus depurator* (F), *Turritella communis* (R), *Aequipecten opercularis* (R)	SS.SMx.CMx		
SOS1/09	Uneven, fissured bedrock with pockets of sediment in fissures and lows and boulder patches; one extensive area of shell gravel with adjacent rock polished by scour	Rock strongly dominated by crust of *Balanus crenatus* (A in places but denuded in others) and dense *Urticina felina* (A). Young *Cancer pagurus* (c. 5-10 cm carapace width) are locally abundant, presumably predating the barnacles, as is *Nucella lapillus* (P). A sparse sponge fauna includes *Hymedesmia paupertas*? (R) and orange (R) and yellow (R) encrusting/cushion forms. Other sessile species comprise sparse hydroids (R), including *Tubularia indivisa*? (R), *Botryllus schlosseri*? (R), *Metridium senile* (P) and *Alcyonium digitatum* (R). Other motile species include *Echinus esculentus* (O) and *Asterias rubens* (R)	CR.HCR.FaT.CTub SS.SCS.CCS		CTub differs from the typical form of the biotope in the sparsity of *Tubularia*
SOS2/09	Shell gravel with small outcrops of scour-polished rock	No evidence of life in the presumably highly mobile sediment. Only yellow sponge? crusts visible on the rock	SS.SCS.CCS		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SOS1/10	Uneven, fissured bedrock with boulders in gulleys and lows	Fauna dominated by dense *Balanus crenatus* (A), *Urticina felina* (A) and an extensive yellow sponge crust (C) and *Esperiopsis fucorum* (O), at least in the more current-swept areas. The photographs also appear to show frequent polyclinid cushions and a patchy bryozoan turf, at least locally. *Echinus esculentus* (F), Asteroidea spp. indet (F), *Henricia* sp. (locally C), *Alcyonium digitatum* (R)	CR.HCR.FaT.CTub		CTub differs from the typical form of the biotope in the sparsity of *Tubularia*
SOS2/10	Uneven, fissured bedrock with boulders in gulleys and lows	Fauna dominated by dense *Balanus crenatus* (A), *Urticina felina* (A) and an extensive yellow sponge crust (C, at least durung the first half of the run) and *Esperiopsis fucorum* (O), at least in the more current-swept areas. The photographs also appear to show occasional polyclinid cushions and a patchy bryozoan turf, at least locally. *Echinus esculentus* (F), Asteroidea spp. indet (O), *Henricia* sp. (P), *Cancer pagurus* (P), *Tubularia indivisa*? (R), *Metridium senile* (P), pink coralline algae? (R)	CR.HCR.FaT.CTub		CTub differs from the typical form of the biotope in the sparsity of *Tubularia*
SOS3/10	Predominantly shell gravel initially, with small outcrops of scour-polished rock and occasional boulders, gradually becoming waves of coarse sand	The sediment shows no evidence of life; the rock is devoid of life, apart from very sparse *Balanus crena*tus? (R)	SS.SCS.CCS		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
NH21/D1	Coarse mixed sediment?	Continuous sheet of mussel shells, presumed to be *Modiolus modiolus*, which appear to support a hydroid turf (F-A), which may be augmented by ophiuroid arms. The proportion of live mussels cannot be discerned. Dense populations of *Echinus esculentus* (A) and *Asterias rubens* (C) are present, together with *Cancer pagurus* (P)	SS.SBR.SMus.ModT	HM	Note that due to the very poor image quality for all the Noss Head video footage little detail could be discerned and wide abundance estimates are applicable. In particular, mussel densities could not be reliably determined, as discrimination between live and dead material was not generally possible
NH21/D2	Substrate not visible but almost certainly sedimentary	Continuous sheet of mussel shells, although the proportion of living individuals cannot be ascertained. The shells appear to support a hydroid turf (F-A), which may be augmented by ophiuroid arms. Dense populations of *Echinus esculentus* (A) and *Asterias rubens* (C) are present, together with *Cancer pagurus* (P), Paguridae sp. (P), *Aequipecten opercularis* (P) and *Flustra foliacea*? (P)	SS.SBR.SMus.ModT	HM	
NH21/D3	Substrate not visible but almost certainly sedimentary	Continuous sheet of mussel shells, although the density of live material quite unknown, although many probably present. *Echinus esculentus* (A), *Asterias rubens* apparently sparse (P), hydroids (P), Paguridae sp. (P), *Aequipecten opercularis* (P)	SS.SBR.SMus.ModT	HM	Living *Modiolus* material may be too sparse to constitute the biotope

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
NH22/D1	Apparently coarse sediment, formed into waves for much of the run, with scattered cobbles and boulders and areas of dense slab-shaped boulders	Some dead mussel shells visible at times but no firm evidence of live mussels, although it is possible that the run may verge onto the mussel bed at times. Rock surfaces appear bare and support *Echinus esculentus* (P) and *Alcyonium digitatum*? (P)	SS.SCS.CCS CR.MCR.EcCr.FaAlCr		Poor visibility renders both biotopes uncertain
NH22/D2	Substrate not visible but almost certainly sedimentary	Continuous sheet of mussel shells, although the density of live material quite unknown, although many probably present. *Echinus esculentus* (A), *Asterias rubens* (C, at least locally)	SS.SBR.SMus.ModT	HM	
NH22/D3	Silty, probably mixed, sediment	Dense mussel shells, with *Asterias rubens* (C, at least locally), *Echinus esculentus* (P), *Flustra foliacea* (P) and extensive but patchy cover of ophiuroids (S in patches). Hydroid clumps (P)	SS.SBR.SMus.ModT		
NH22/D3	Areas of sediment and flat, laminar bedrock and scattered boulders and cobbles	Areas of dense mussel shells as in the first half of the run but rock substrates support *Spirobranchus* spp.? (C) and dense *Echinus esculentus* (A) and also provide a substrate for patches of dense ophiuroids (S). *Crossaster papposus* (P), *Callionymus* sp. (P)	SS.SBR.SMus.ModT CR.MCR.EcCr.FaAlCr CR.MCR.EcCr.FaAlCr.Bri		Poor visibility renders biotopes uncertain. SS.SMx.CMx.OphMx may also be present
NH22/D4	Waves of coarse sand/shell gravel becoming a plain of shell gravel in deeper water	Little evidence of life, apart from *Asterias rubens* (O) and shoaling fish	SS.SCS.CCS		
NH22/D4	Largely obscured, but initially shell gravel/broken shell and subsequently apparently sedimentary	Largely blanket coverage by dense mussel shells with high numbers of *Echinus esculentus* (A) and *Asterias rubens* (C), and abundant brittlestars (*Ophiothrix fragilis*?) amongst the shells, at least in places. Hydroid clumps (C)	SS.SBR.SMus.ModT	HM	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
NH22/D5	Mixed sediment, with scattered boulders towards the end of the run	Largely blanket coverage by dense mussel shells with high numbers of *Echinus esculentus* (A) and *Asterias rubens* (C), and abundant brittlestars (*Ophiothrix fragilis*?) amongst the shells, at least in places; hydroid clumps (C). Boulders are encrusted with *Spirobranchus* spp.? (C) and support *Echinus esculentus* (C)	SS.SBR.SMus.ModT CR.MCR.EcCr.FaAlCr	HM	
NH22/D6	Slightly silty shell gravel, with scattered cobbles and boulders	*Asterias rubens* (F), *Echinus esculentus* (F, but A on boulders))	SS.SCS.CCS		
NH22/D6	Scattered cobbles and boulders on pebbly mixed sediment?	*Echinus esculentus* (C, but A on boulders), *Asterias rubens* (P), *Cancer pagurus* (P). Boulders encrusted with *Spirobranchus* spp.? (C)	SS.SMx.CMx CR.MCR.EcCr.FaAlCr		Biotopes highly uncertain due to poor video quality
NH22/D6	Possibly mixed sediment with scattered cobbles and boulders	Substratum with dense brittlestar cover (S). *Ophiocomina nigra* (P), *Echinus esculentus* (C), *Luidia ciliaris* (P), *Crossaster papposus* (P), *Asterias rubens* (O)	SS.SMx.CMx.OphMx		
NH22/D7	Scatter of cobbles and boulders on pebbly mixed sediment?	Brittlestar bed (S) with stones encrusted with *Spirobranchus* spp.? (C) and supporting *Echinus esculentus*	SS.SMx.CMx.OphMx		Biotope also close, in part, to FaAlCr.Bri
LW2	Uneven bedrock, with areas of boulders on coarse sand with pebbles	Rock encrusted with pink coralline (A) and red (C) algae, *Parasmittina trispinosa* (O) and *Balanus* spp. (P) and heavily grazed by *Echinus esculentus* (C, locally A) and *Asterias rubens* (C, locally A). More elevated surfaces also support foliose algae, particularly *Dictyota dichotoma* (R overall). *Alcyonium digitatum* (R, but locally A), *Crossaster papposus* (O), *Marthasterias glacilais* (P), *Cliona celata* (R), *Ophiura albida*? (P), hydroid clumps (R)	CR.MCR.EcCr.FaAlCr		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW3	Dense boulders on shell gravel with areas of outcropping bedrock	Fauna dominated by profuse coverage by *Corynactis viridis* (A) and *Alcyonium digitatum* (A), with dense brittlestars (*Ophiothix fragilis*; S, *Ophiocomina nigra*, A). The rock is also encrusted with *Spirobranchus* spp. (A) and pink coralline algae (O). *Echinus esculentus* (C), yellow sponges (R) (including *Cliona celata*), *Flustra foliacea* (R), *Calliostoma zizyphinum* (P), *Marthasterias glacialis* (P), *Asterias rubens* (P)	CR.MCR.EcCr.CarSp.Bri		
LW4	Bedrock with coarse sand pockets and boulders on coarse sand with varying admixture of pebbles	Rock encrusted with pink coralline algae (C), *Parasmittina trispinosa* (O) and *Spirobranchus* spp. (C) and with a patchy cover of brittlestars, varying locally but including *Ophiothrix fragilis* (S), *Ophiocomina nigra* (A) and *Ophiura albida* (P). Other echinoderms include *Echinus esculentus* (C), *Asterias rubens* (O), *Crossaster papposus* (P), *Luidia ciliata* (P) and *Porania pulvillus* (P). *Urticina felina* (P), *Alcyonium digitatum* (R)	CR.MCR.EcCr.FaAlCr.Bri		
LW5	Uneven bedrock and boulders on coarse sand	Rock encrusted with pink coralline (A), red (O) and brown (R) algae, *Parasmittina trispinosa* (O) and sparse *Spirobranchus* spp. (O) and *Balanus* spp. (P). *Alcyonium digitatum* is occasional overall, but forms dense patches (C), such as on some vertical faces and ridge tops. A fairly sparse sponge fauna includes scattered *Cliona celata* (R), *Pachymatisma johnstonia* (R) and *Halichondria panicea*? (R). Large areas support dense brittlestars, strongly dominated by *Ophiocomina nigra* (A) but with *Ophiothrix fragilis* also present, particularly between boulders. Other echinoderms include *Echinus esculentus* (C), *Asterias rubens* (F), *Crossaster papposus* (P) and *Marthasterias glacialis* (P). *Calliostoma zizyphinum* (P), *Nemertesia antennina* (R)	CR.MCR.EcCr.FaAlCr.Bri CR.MCR.EcCr.FaAlCr		The presence of massive sponges places this site close to CR.MCR.EcCr.CarSp. It would also be possible to recognise patches of FaAlCr.Adig

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW6	Dense boulders on coarse sand	Rock encrusted with pink coralline algae (A), red algae (R), *Parasmittina trispinosa* (O) and *Spirobranchus* spp. (C). Abundant *Ophiocomina nigra* are supported on upper rock faces, whilst abundant *Ophiothrix fragilis* are concentrated at the base of the boulders. *Alcyonium digitatum* (R), *Echinus esculentus* (C), *Asterias rubens* (P)	CR.MCR.EcCr.FaAlCr.Bri		
LW7	Waves of medium sand with broken shell and pebbles in troughs	No biota observed	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
LW7	Dense boulders on sand and highly uneven bedrock outcrops	Rock encrusted with pink coralline algae (O), *Parasmittina trispinosa* (O), red bryozoans (R), *Spirobranchus* spp. (A, locally S) and with dense *Caryophyllia smithii* (C, locally A), *Alcyonium digitatum* (C, locally A) and *Corynactis viridis* (A in patches). The sponge fauna includes *Cliona celata* (R) and sparse patches of unidentified forms (R) and there is an erect bryozoan fauna comprising *Porella compressa* (F at least locally) and scattered but extensive patches of *Flustra foliacea* (locally S). *Echinus esculentus* (C), *Luidia ciliaris* (P), *Asterias rubens* (P), *Urticina felina* (R), *Nemertesia antennina* (R) and patchy thin hydroid turf (P)	CR.MCR.EcCr.CarSp.Bri		It would also be possible to recognise a number of EcCr biotopes depending upon local variations in the dominance of characterising species
LW7	Rippled fine-medium sand	No biota observed, apart from 1 *Scophthalmus* sp.	SS.SSa.CFiSa		
LW7	Dense boulders on sand	Boulders encrusted with pink coralline algae (O), *Parasmittina trispinosa* (F) and *Spirobranchus* spp. (A) and with dense *Caryophyllia smithii* (C). Very sparse patches of *Cliona celata* (R) and hydroids, including *Nemertesia antennina* (R). *Echinus esculentus* (F), *Asterias rubens* (P)	CR.MCR.EcCr.FaAlCr.Car		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW8	Dense boulders and cobbles	Crust community strongly dominated by dense *Spirobranchus* spp. (A), with *Parasmittina trispinosa* (O), red bryozoans (P) and pink coralline algae (R). For most of the run the substrate supported dense *Ophiocomina nigra* (A), although with some brittlestar-free areas. *Cliona celata* (R), *Echinus esculentus* (C), *Asterias rubens* (F), *Luidia ciliaris* (O), *Nemertesia antennina* (R). *Caryophyllia smithii* locally frequent, though absent for most of the run	CR.MCR.EcCr.FaAlCr.Bri CR.MCR.EcCr.FaAlCr		
LW9	Low profile bedrock ridges, broken into boulders in places	Rock encrusted with pink coralline (A), red (R) and brown (R) algae, *Parasmittina trispinosa* (R) and sparse *Spirobranchus* spp. (F). Erect community fairly poorly developed, with *Alcyonium digitatum* (O), *Cliona celata* (R), *Halichondria panicea*? (R) and *Phyllophora crispa*? (R). The motile fauna includes *Ophiocomina nigra* (C), *Echinus esculentus* (C), *Asterias rubens* (F), *Crossaster papposus* (R), *Marthasterias glacialis* (P) and *Gibbula* spp. (F)	CR.MCR.EcCr.FaAlCr		
LW10	Uneven bedrock with gullies and areas of cobbles and boulders on coarse sediment	Kelp park consisting of mostly abundant but small plants of *Laminaria hyperborea* with an understorey of foliose red algae (C), including *Callophylis laciniata* (P) and *Delesseria sanguinea* (P), as well as *Dictyota dichotoma* (P). The rock is encrusted with pink coralline (C) and red (C) algae, *Parasmittina trispinosa* (R) and *Balanus* spp. (O), with a sparse cushion fauna including *Botryllus schlosseri* (R) and *Polymastia boletiformis* (R). *Echinus esculentus* (C), *Asterias rubens* (C), *Crossaster papposus* (R), *Alcyonium digitatum* (R)	IR.MIR.KR.Lhyp.Pk		
LW10	Uneven bedrock with gullies and areas of cobbles and boulders on shell gravel	Rock encrusted with pink coralline (F) and red (O) algae, *Spirobranchus* spp. (F) and *Parasmittina trispinosa* (R). *Alcyonium digitatum* (O, locally C), foliose red algae (R), *Echinus esculentus* (C, locally A), *Asterias rubens* (C), *Calliostoma zizyphinum* (P), *Ophiocomina nigra* (C at end of run)	CR.MCR.EcCr.FaAlCr		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW11	Bedrock ridges and boulders and cobbles on coarse sand	Rock encusted with pink coralline (A), red (R) and brown (R) algae, *Sprirobranchus* spp. (F) and *Parasmittina trispinosa* (R) and with abundant *Ophiocomina nigra* and *Ophiothrix fragilis* varying in dominance locally. *Alcyonium digitatum* occasional overall but also present in dense patches. *Echinus esculentus* (C), *Asterias rubens* (P), *Inachus* sp. (P), *Urticina felina* (R), *Marthasterias glacialis* (P), *Nemetesia antennina* (R)	CR.MCR.EcCr.FaAlCr.Bri		
LW12	Dense boulders and cobbles on coarse sand	Rock encrusted with pink coralline algae (A), red algae (R), *Parasmittina trispinosa* (O), red bryozoans (O) and *Spirobranchus* spp. (C). Abundant *Ophiocomina nigra* are supported on upper rock faces, whilst abundant *Ophiothrix fragilis* are concentrated at the base of and between the stones. *Alcyonium digitatum* (R), *Echinus esculentus* (C), *Asterias rubens* (P)	CR.MCR.EcCr.FaAlCr.Bri		
LW13	Occasional bedrock but mostly boulders and cobbles with coarse sand infill and some larger sand patches	Rock encrusted with pink coralline algae (A), red algae (R), *Parasmittina trispinosa* (O), red bryozoans (O) and *Spirobranchus* spp. (C). Dense brittlestar cover includes *Ophiocomina nigra* (A) and *Ophiothrix fragilis* (A). Scattered hydroid clumps include *Thuiaria thuja* (R) and *Nemertesia antennina* (R). *Ascidia mentula* (R), *Cancer pagurus* (R), *Chaetopterus variopedatus* (R), *Echinus esculentus* (C), *Asterias rubens* (P), *Alcyonium digitatum* (R, but C locally)	CR.MCR.EcCr.FaAlCr.Bri		
LW14	Boulders and cobbles with coarse sand infill	Rock encrusted with pink coralline algae (A), *Parasmittina trispinosa* (O), red bryozoans (O) and *Spirobranchus* spp. (C). Dense brittlestar cover includes *Ophiocomina nigra* (A) and *Ophiothrix fragilis* (A). Scattered hydroid clumps include *Nemertesia antennina* (R). *Echinus esculentus* (C), *Asterias rubens* (P), *Alcyonium digitatum* (R), *Marthasterias glacialis* (R), *Scyliorhinus* sp. (P)	CR.MCR.EcCr.FaAlCr.Bri		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW15	Mostly uneven angular bedrock with coarse sand pockets, sometimes with boulders, in lows and gulleys	Rock encrusted with pink coralline (F), brown (O) and red (O) algae (F), *Parasmittina trispinosa* (R) and *Spirobranchus* spp. (F). Although apparently sparse overall, there are dense patches of *Corynactis viridis* (locally F) and a bryozoan turf (locally C). *Alcyonium digitatum* is also locally dense (A) but frequent overall and there are dense patches of *Ophiocomina nigra* (locally A). *Echinus esculentus* (C, locally A), *Asterias rubens* (P), *Nemertesia antennina* (R), *Marthasterias glacialis* (O), *Calliostoma zizyphinum* (P), *Dictyota dichotoma* (R), *Inachus* sp. (P)	CR.MCR.EcCr.FaAlCr CR.MCR.EcCr.FaAlCr.Bri		The patchy bryozoan turf and *Corynactis* cushions make this a weak fit to the biotope
LW16	Boulders and cobbles on medium sand with low-profile sand-dusted bedrock outcrops and patches of sand	Community dominated by dense brittlestar bed with *Ophiothrix fragilis* (S) and *Ophiocomina nigra* (A). Rock is lightly encrusted with pink coralline algae (F), *Parasmittina trispinosa* (R), red bryozoans (R and *Spirobranchus* spp. (C) and supports frequent *Alcyonium digitatum* and sparse patches of *Corynactis viridis* (locally C). *Urticina felina* (C), *Echinus esculentus* (C), *Crossaster papposus* (R), *Calliostoma zizyphinum* (P), *Marthasterias glacialis* (R), Pleuronectidae sp. (O), Triglidae sp? (O)	CR.MCR.EcCr.FaAlCr.Bri SS.SSa.CFiSa		
LW17	Sand-scoured bedrock, stepped in places, and boulders and cobbles on medium sand, with sand patches and an area of cobbles and pebbles on medium sand	Community dominated by dense brittlestar bed with *Ophiothrix fragilis* (S) and *Ophiocomina nigra* (A). Rock is lightly encrusted with pink coralline algae (O), *Parasmittina trispinosa* (R) and *Spirobranchus* spp. (C) and supports frequent *Alcyonium digitatum* and sparse patches of *Corynactis viridis* (locally A). *Urticina felina* (C), *Echinus esculentus* (C), *Crossaster papposus* (O), *Luidia ciliaris* (O), *Flustra foliacea* (R), *Cliona celata* (R), Pleuronectidae sp. (R), Triglidae sp? (O)	CR.MCR.EcCr.FaAlCr.Bri SS.SSa.CFiSa		The sparse massive sponges and *Corynactis* cushions make this a weak fit to the biotope

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW18	Mostly low-profile sand-scoured bedrock, often ridged, with boulders and cobbles on medium sand	Community dominated by dense brittlestar bed with *Ophiothrix fragilis* (S) and *Ophiocomina nigra* (A). Rock is encrusted with pink coralline algae (F) and *Spirobranchus* spp. (C) and supports fairly dense *Alcyonium digitatum* (C) and sparse patches of erect bryozoans including *Flustra foliacea* (R), *Securiflustra securifrons* (R) and a crisiid? turf (R). *Urticina felina* (P), *Echinus esculentus* (F), *Cliona celata* (R), *Asterias rubens* (P), *Nemertesia antennina* (R)	CR.MCR.EcCr.FaAlCr.Bri		
LW19	Uneven bedrock outcrops, some very extensive, and boulders and cobbles on medium sand	For most of the run, rock surfaces are covered by dense brittlestars (*Ophiothrix fragilis* S, *Ophiocomina nigra* A) although some of the bedrock outcrops have few or no brittlestars. The rock is encrusted with pink coralline (C) and red (R) algae, *Parasmittina trispinosa* (O), red bryozoans (R) and *Spirobranchus* spp. (C) and supports frequent *Alcyonium digitatum* (but locally A) and sparse sponges, including *Cliona celata* (R), and initially dense patches of *Corynactis viridis* on bedrock (locally A). *Urticina felina* (F), *Echinus esculentus* (C), *Calliostoma zizyphinum* (P), *Molva molva* (O)	CR.MCR.EcCr.FaAlCr CR.MCR.EcCr.FaAlCr.Bri	MM	The presence of *Corynactis* viridis and massive sponges places the brittlestar-free areas close to CR.MCR.EcCr.CarSp
LW20	Bedrock ridges and boulders and cobbles on medium-coarse sand	Rock surfaces encrusted with pink coralline algae (C), *Parasmittina trispinosa* (R) and *Spirobranchus* spp. (F) and supporting dense brittlestars (*Ophiothrix fragilis* S, *Ophiocomina nigra* A), *Alcyonium digitatum* (C) and patches of *Cliona celata* (R). *Urticina felina* (P), *Echinus esculentus* (C), *Crossaster papposus* (O), Asteroidea spp. indet (P), *Balanus balanus*? (R), *Caryophyllia smithii* (R), *Molva molva* (P)	CR.MCR.EcCr.FaAlCr.Bri	MM	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW21	Uneven bedrock, and boulders and cobbles on medium-coarse sand, interrupted by areas of medium-coarse sand waves	Rock surfaces encrusted with pink coralline algae (C), *Parasmittina trispinosa* (R), red bryozoans (O) and *Spirobranchus* spp. (C) and supporting dense brittlestars (*Ophiothrix fragilis* S, *Ophiocomina nigra* A), *Alcyonium digitatum* (F) and patches of *Cliona celata* (R). *Urticina felina* (P), *Echinus esculentus* (C), *Crossaster papposus* (R), Asteroidea spp. indet (O), *Luidia ciliaris* (R), *Porania pulvillus* (R)	CR.MCR.EcCr.FaAlCr.Bri		
LW22	Bedrock, often in the form of ridges, and boulders and cobbles on medium-coarse sand	Rock surfaces encrusted with pink coralline algae (C), *Parasmittina trispinosa* (R), red bryozoans (O) and *Spirobranchus* spp. (C) and supporting dense brittlestars (*Ophiothrix fragilis* S, *Ophiocomina nigra* A). *Alcyonium digitatum* (R), *Cliona celata* (R), *Urticina felina* (F), *Echinus esculentus* (C), *Crossaster papposus* (R), Asteroidea spp. indet (O), *Munida sarsi* (R), *Eledone cirrhosa* (P)	CR.MCR.EcCr.FaAlCr.Bri		
LW23	Mostly uneven bedrock with small patches of boulders and cobbles on medium-coarse sand	Rock surfaces encrusted with pink coralline (F), red (O) and brown (R) algae, *Parasmittina trispinosa* (R), red bryozoans (R) and *Spirobranchus* spp. (F) and supporting fairly dense brittlestars (*Ophiothrix fragilis* C, *Ophiocomina nigra* A) and patches of bryozoan turf (overall R). *Alcyonium digitatum* (O), *Haliclona* sp.? (R), *Urticina felina* (P), *Echinus esculentus* (C), *Crossaster papposus* (O), *Marthasterias glacialis* (O), Asteroidea spp. indet (P), *Dictyota dichotoma* (R), *Henricia* sp. (R), *Nemertesia antennina* (R)	CR.MCR.EcCr.FaAlCr.Bri		
LW24	Mostly uneven bedrock with small patches of boulders and cobbles on medium-coarse sand	Rock surfaces encrusted with pink coralline algae (C), *Parasmittina trispinosa* (R), red bryozoans (R) and *Spirobranchus* spp. (F) and supporting dense brittlestars (*Ophiothrix fragilis* S, *Ophiocomina nigra* A). *Alcyonium digitatum* (R), *Urticina felina* (P), *Echinus esculentus* (C), *Marthasterias glacialis* (R), *Asterias rubens* (P), Asteroidea spp. indet (O), *Luidia ciliaris* (R), *Cliona celata* (R)	CR.MCR.EcCr.FaAlCr.Bri		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW25	Mostly uneven bedrock with small patches of boulders and cobbles on coarse sand	Rock surfaces encrusted with pink coralline (C), red (R) and brown (R) algae, *Parasmittina trispinosa* (R), red bryozoans (R) and *Spirobranchus* spp. (F) and supporting dense brittlestars in places (*Ophiocomina nigra* A, *Ophiothrix fragilis* locally A). A sparse sponge fauna includes *Polymastia boletiformis* (R), *Cliona celata* (R) and *Pachymatisma johnstonia* (R) and there are widely scattered patches of a bryozoan turf (R, but locally A). *Alcyonium digitatum* (O), *Urticina felina* (P), *Echinus esculentus* (C), *Marthasterias glacialis* (O), *Asterias rubens* (P), Asteroidea spp. indet (O), *Luidia ciliaris* (R), *Crossaster papposus* (O), Cirripedia spp. (R), hydroid tufts (R), *Calliostoma zizyphinum* (P)	CR.MCR.EcCr.FaAlCr CR.MCR.EcCr.FaAlCr.Bri		These biotopes are also close to the respective variants of CR.MCR.EcCr.CarSp
LW26	Uneven bedrock and extensive areas of boulders and cobbles on coarse sand	Rock surfaces encrusted with pink coralline (A) and red (R) algae, *Parasmittina trispinosa* (O), red bryozoans (R) and *Spirobranchus* spp. (C) and supporting dense *Ophiocomina nigra* (A), with *Ophiothrix fragilis* locally abundant. A sparse sponge fauna includes *Cliona celata* (R) and *Myxilla incrustans*? (R). *Alcyonium digitatum* (O), *Echinus esculentus* (C), *Flustra foliacea* (R, but large patches), *Marthasterias glacialis* (O), *Asterias rubens* (O), Asteroidea spp. indet (O)	CR.MCR.EcCr.FaAlCr.Bri		
LW27	Waves of medium sand	Occasional *Ophiocomina nigra*	SS.SSa.CFiSa		
LW27	Extensive areas of boulders and cobbles on medium-coarse sand, and extensive area of uneven bedrock	Rock surfaces densely encrusted with *Spirobranchus* spp. (A) and with pink coralline algae (F) *Parasmittina trispinosa* (O) and red bryozoans (R). Some extensive areas where *Flustra foliacea* is superabundant. *Caryophyllia smithii* (F), *Urticina felina* (R), *Echinus esculentus* (C), *Porania pulvillus* (R), *Marthasterias glacialis* (R), *Crossaster papposus* (R), Asteroidea spp. indet (O), *Cliona celata* (R), *Porella compressa* (R), hydroid clumps (R), *Ctenolabrus rupestris* (R)	CR.MCR.EcCr.CarSp.PenPcom		This site could also be ascribed to CR.MCR.EcCr.FaAlCr.Car and FaAlCr.Flu

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Site ID	Substrate	Biota	Biotope	PMF	Comments
LW28	Mostly dense cobbles and boulders	Stones of bare appearance, although densely encrusted with *Spirobranchus* spp. (A) and with *Parasmittina trispinosa* (O) and red bryozoans (R); widely scattered brittlestars (*Ophiocomina nigra* C, *Ophiothrix fragilis* F) *Crossaster papposus* (F), *Asterias rubens* (P), *Stichastrella rosea*? (F), *Urticina felina* (P), *Echinus esculentus* (F)	CR.MCR.EcCr.FaAlCr.Pom		
LW28	Heterogeneous substrate of pebbles, cobbles and small boulders on sand	Stones encrusted with *Spirobranchus* spp. (C) and *Parasmittina trispinosa* (O), with occasional patches of *Flustra foliacea*. *Crossaster papposus* (P), *Echinus esculentus* (F), *Marthasterias glacialis* (P), hydroid clumps (R), including *Nemertesia ramosa* (R)	SS.SMx.CMx.FluHyd		
LW28	Waves of medium-coarse sand with scattered boulders	Sediment with little life visible, apart from occasional *Ophiocomina nigra*. Boulders supporting patches of *Flustra foliacea* (R) and *Securiflustra securifrons* (R).	SS.SCS.CCS		
LW28	Mostly dense cobbles and boulders	Rock encrusted with abundant *Spirobranchus* spp., *Parasmittina trispinosa* (O) and red bryozoans (R) and supporting abundant *Ophiocomina nigra*. *Ophiothrix fragilis* (P), *Caryophyllia smithii* (O), *Porania pulvillus* (R), *Echinus esculentus* (C), *Marthasterias glacialis* (R), *Luidia ciliaris* (O)	CR.MCR.EcCr.FaAlCr.Bri		
LW29	Medium sand, possibly in low waves	No life visible apart from *Astropecten irregularis*? (R)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW30	Dense boulders and cobbles, with patches of sand and pebbles and cobbles on sand	Rock encrusted with abundant *Spirobranchus* spp., *Parasmittina trispinosa* (O), red bryozoans (R) and pink coralline algae (R) and with scattered patches of *Flustra foliacea*, becoming common in some areas, particularly close to sediment patches. *Caryophyllia smithii* is also common locally, though appears absent over most of the run. *Ophiocomina nigra* (R, locally C), *Echinus esculentus* (C), *Marthasterias glacialis* (O), *Luidia ciliaris* (F), *Crossaster papposus* (R), Cirripedia spp. (R), hydroid clumps (R), Asteroidea spp. indet (R), *Cliona celata* (R), *Ctenolabrus rupestris* (R), *Stichastrella rosea*? (O)	CR.MCR.EcCr.FaAlCr.Pom CR.MCR.EcCr.FaAlCr.Flu		
LW31	Rppled fine-medium sand	No visible life apart from *Callionymus lyra* (P) present in medium-coarse sand close to the sand/rock transition	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
LW31	Boulders and cobbles on sand and extensive areas of bedrock	Rock encrusted with *Spirobranchus* spp. (C), *Parasmittina trispinosa* (R) and red bryozoans (R) and supporting a dense population of *Caryophyllia smithii* (A) and a diverse sponge fauna including *Cliona celata* (R), *Axinella infundibuliformis*? (R), *Haliclona* sp.? (R), *Hymedesmia paupertas*? (R) and yellow encrusting sponges indet. (R). The site is notable for the presence of *Pentapora fascialis* (R). *Alcyonium digitatum* (R but dense patches), *Echinus esculentus* (C), *Porella compressa* (F), *Flustra foliacea* (O), hydroid clumps (R), Ascidiacea spp. (R),, *Asterias rubens* (P), *Marthasterias glacialis* (R), *Crossaster papposus* (R), *Luidia cilairis* (O), Asteroidea spp. indet (O)	CR.MCR.EcCr.CarSp.PenPcom		
LW32	Waves of fine-medium sand with broken shell in troughs, interrupted by extensive area of rippled fine-medium sand	No discernible biota observed	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
LW33	Waves of medium sand with broken shell in troughs	No discernible biota observed, apart from *Luidia ciliaris* (R)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
LW34	Dense boulders and cobbles on sand	Rock encrusted with abundant *Spirobranchus* spp., and pink coralline algae (C), *Parasmittina trispinosa* (O) and red bryozoans (O) and supporting dense brittlestars (*Ophiocomina nigra* A, *Ophiothrix fragilis* S). *Echinus esculentus* (C), *Alcyonium digitatum* (R), hydroid clumps (R), *Stichastrella rosea*? (R), *Chaetopterus vaiopedatus* (R), *Gibbula* spp. (P)	CR.MCR.EcCr.FaAlCr.Bri		
LW35	Bedrock, often in the form of ridges with sand channels in the troughs; areas of boulders and cobbles on sand	Rock encrusted with *Spirobranchus* spp. (C), pink coralline algae (A), *Parasmittina trispinosa* (F) and red bryozoans (O) and supporting dense brittlestars (*Ophiocomina nigra* A, *Ophiothrix fragilis* S). *Echinus esculentus* (C), *Alcyonium digitatum* (R, locally A), hydroid clumps (R), *Flustra foliacea* (R), *Urticina felina* (P), *Cancer pagurus* (R), *Asterias rubens* (R), *Porania pulvillus* (R), *Marthasterias glacialis* (O), *Crossaster papposus* (O), Asteroidea spp. indet (O), *Cliona celata* (R)	CR.MCR.EcCr.FaAlCr.Bri		
LW36	Bedrock with sand pockets and channels and areas of boulders and cobbles on sand	Rock encrusted with *Spirobranchus* spp. (A), pink coralline algae (C), *Parasmittina trispinosa* (O) and red bryozoans (O) and supporting dense brittlestars (*Ophiocomina nigra* A, *Ophiothrix fragilis* A). *Echinus esculentus* (C), hydroid clumps (R), *Calliostoma zizyphinum* (P), *Asterias rubens* (O), *Crossaster papposus* (O), *Cliona celata* (R)	CR.MCR.EcCr.FaAlCr.Bri		
CITV1	Soft mud	Densely burrowed mud with c. 1.5 cm diameter vertical burrows 1-9/0.1m^2. *Pachycerianthus multiplicatus* and *Funiculina quadrangularis* both common. Caridea sp. (R), Pisces sp. (P)	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ PM	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
CITV2	Soft mud	Densely burrowed mud with c. 1.5 cm diameter vertical burrows 1-9/0.1m^2 and many smaller burrows and sparse *Nephrops* burrows; *Nephrops norvegicus* (P). Frequent *Funiculina quadrangularis* supporting *Asteronyx loveni* (O). Caridea sp. (R), Pisces sp. (P), *Scyliorhinus* sp. (P)	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ	
CITV3	Soft mud	Densely burrowed mud with c. 1.5 cm diameter vertical burrows 1-9/0.1m^2 and many smaller burrows. *Pachycerianthus multiplicatus* (C), *Funiculina quadrangularis* (P), Pisces (P)	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ PM	
KR1/10	Heterogeneous substrate of shelly sand with gravel, pebbles and cobbles and occasional small boulders	Fairly impoverished and presumably strongly current-swept. Stones are lightly encrusted with serpulid worms (F) and pink coralline algae (R) and support sparse algal tufts, including *Ulva* sp. (R). With increasing depth the silt content increases and the fauna becomes richer. *Cancer pagurus* (O), *Asterias rubens* (O), *Echinus esculentus* (O), *Pecten maximus* (P), *Munida sarsi* (O), Asteroidea spp. indet (O)	SS.SCS.CCS.PomB		Intermediate between PomB and a CMx biotope
KR1/10	Muddy sand	With movement down a slope away from Kyle Rhea narrows, *Funculina quadrangularis* increases in density becoming abundant over a wide area. Sediment is sparsely burrowed with mostly small burrows, some occupied by *Munida sarsi* (F) and occasional larger, *Nephrops*-like burows. *Turritella communis* (F), *Cerianthus lloydii* (O), *Myxicola infundibulum* (R), *Echinus esculentus* (P), *Cancer pagurus* (P), *Pennatula phosphorea* (R)	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ	Apparently much sandier and too little megafaunally-worked to be typical of the biotope

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
KR2/10	Boulders and cobbles on shell gravel with extensive areas of uneven outcropping bedrock	Community dominated by *Alcyonium digitatum* (C, locally A) and scattered *Laminaria hyperborea* (F, locally C). The rock is encrusted with pink coralline algae (A) and supports a sparse red algal flora, including *Delesseria sanguinea* (R), and in places a turf of hydroids including *Tubularia indivisa* (locally C). *Asterias rubens* (F), *Echinus esculentus* (F), *Cliona celata*? (R), *Antedon* spp. (P)	IR.MIR.KR.LhypTX.Pk IR.MIR.KR.LhypT.Pk	TS	
KR2/10	Heterogeneous substrate of coarse gravelly sand with pebbles, cobbles and boulders	Fairly impoverished community with encrustations of pink coralline algae (O) and orange bryozoans (R), patchy hydroid turf and clumps, *Caryophyllia smithii* (P), *Pecten maximus* (P), *Echinus esculentus* (P), *Antedon* spp. (P) and *Asterias rubens* (O)	SS.SMx.CMx CR.MCR.EcCr.FaAlCr		Areas of dense boulders have been assigned FaAlCr
KR3/10	Uneven bedrock and fields of cobbles and boulders	Profuse development of *Alcyonium digitatum* (A, but S in places) and large patches of yellow sponges, including *Myxilla incrustans* (O) and small patches of *Pachymatisma johnstonia* (R). A short hydroid/bryozoan turf is common and there are occasional patches of the much larger *Sertularia argentea*. Foliose and filamentous red algae are common and in places superabundant; *Delesseria sanguinea* appears to be a prominent component. At the end of the run the community is augmented by the addition of frequent *Laminaria hyperborea*. Cancer pagurus (P), *Calliostoma zizyphinum* (P), orange bryozoans (R), *Ctenolabrus rupestris* (P), *Urticina felina* (P), *Tubularia indivisa* (P), *Asterias rubens* (F), *Echinus esculentus* (F), *Henricia* sp. (P)	CR.HCR.FaT.CTub.Adig IR.MIR.KR.LhypT.Pk		
KR1/09	Uneven bedrock and boulders	Rock supporting abundant *Alcyonium digitatum* and extensive coverage of a yellow sponge (C, possibly *Myxilla incrustans*) and patches of *Pachymatisma johnstonia* (O). Serpulid worms (P), *Echinus esculentus* (F), hydroid patches (P)	CR.HCR.FaT.CTub.Adig		No photos available

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SCTV1	Muddy sand with scattered gravel, pebbles, cobbles and small boulders towards the end of the run	Dense *Atrina fragilis*. Overall density was estimated as c. 1/m^2 but exceeds this (i.e. abundant) over the first half of the run. *Atrina* provides a substrate for an associated fauna, apparently dominated by hydroids including *Nemertesia ramosa* and *Halecium halecinum*?, but identifications were limited due to the absence of photos for this site. *Ophiocomina nigra* (C), *Ophiothrix fragilis* (P), *Sabella pavonina*? (F), *Filograna implexa*? (P), *Echinus esculentus* (F), *Luidia ciliaris* (F), *Marthasterias glacialis* (P), *Crossaster papposus* (P), *Asterias rubens* (P), Holothuroidea sp. (R), *Inachus* sp.? (R), *Buccinum undatum*? (R), *Urticina* spp. (R), *Metridium senile*? (R), *Alcyonium digitatum* (R), *Munida sarsi* (O), *Alcyonidium diaphanum* (R). The sediment is perforated by many holes 0.5 - 1.0 cm in diameter (C), some of which house bivalve siphons	SS.SSa.OSa	AF	Assigned to the biotope on the basis of being very deep muddy sand, but in addition to the site being largely dominated by *Atrina*, the site will be tideswept and not typical of existing OSa biotopes
SCTV2	Muddy sand with broken shell fragments and a sparse scatter of Modiolus shells	*Modiolus* bed with clumps of *Modiolus modiolus* (A), the majority of which are almost buried, or completely buried with only the siphons showing, making them very difficult to detect on the video footage. The bivalves support an epifaunal community dominated by hydroids (C) and sponges (F), which includes *Halecium halecinum*?, *Nemertesia ramosa* and *Iophon hyndmani*? Terebellid worms are common, both amongst the clumps and living on the open surface of the sediment. The hydroid/sponge patches reveal the presence of the *Modiolus* clumps. *Ophiocomina nigra* is common for the first third of the run. Other members of the community include *Atrina fragilis* (F), *Sabella pavonina*? (C), *Echinus esculentus* (F), *Myxicola infundibulum* (P), *Urticina* spp. (O), *Merluccius merluccius* (F), *Alcyonium digitatum* (O), *Hippasteria phrygiana* (P), *Ophiothrix fragilis* (P), *Luidia ciliaris* (P), Holothuroidea spp. (R), *Eurynome* sp.? (P), *Macropodia* sp. (R)	SS.SBR.SMus	AF HM	This very deep mussel bed cannot easily be assigned to one of the existing *Modiolus* biotopes. It is, however, sufficiently close to some of the PMF biotopes to be regarded as constituting a PMF

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
SCTV3	Muddy sand with broken shell fragments and a scatter of Modiolus shells, dense in places; boulders and cobbles cover around 50% of the sediment in the latter part of the run	*Modiolus* bed with clumps of *Modiolus modiolus* (initially A), the majority of which are almost buried, or completely buried with only the siphons showing, making them very difficult to detect on the video footage. No distinct clumps are clearly discernible in the latter part of the run, although there appears to be buried individuals between the stones (F-C). *Modiolus* and the stones carry an epifauna dominated by hydroids (F, including *Nemertesia ramosa*) and including *Iophon hyndmani*? (F), *Sabella pavonina*? (F) and *Alcyonium digitatum* (O), with *Neocrania anomala*? and serpulid worms (including *Serpula vermicularis*) also present on boulders. Terebellidae spp. (C), *Myxicola infundibulum* (P), *Ophiocomina nigra* (O, locally A), *Urticina* spp. (O), *Ophiothrix fragilis* (P), *Atrina fragilis* (P, 1 individual observed), *Munida sarsi* (O), *Pagurus bernhardus* (R), Paguridae sp. (R), Caridea sp. (cf. *Lebbeus polaris*, O), *Echinus esculentus* (F), *Luidia cilairis* (P), Holothuroidea spp. (O), *Asterias rubens* (O), *Porania pulvillus* (P)	SS.SBR.SMus.ModCvar	AF HM	This very deep mussel bed cannot easily be assigned to one of the existing *Modiolus* biotopes. It is, however, closest to ModCvar
TRE1	Muddy sand with broken shell and scattered surface shells and sparse cobbles	Very few identifiable forms of life. The sparse shells and cobbles support a hydroid turf (R). *Munida sarsi*? (R), Brachyura sp. (R), *Turritella communis* shells (R)	SS.SSa.CMuSa		Also with affinities to CMx biotopes
TRE2	Mix of sand, gravel and pebbles with a surface scatter of cobbles and boulders	Cobbles and boulders encrusted with serpulid worms (F) and orange bryozoans (O) and support hydroid patches (F, including *Nemertesia ramosa*), *Porella compressa* (P) and *Caryophyllia smithii* (P). *Munida sarsi* present on sediment surface	CR.MCR.EcCr.FaAlCr SS.SMx.CMx		
TRE2	Waves of medium sand with shell material in the troughs	*Luidia ciliaris* (P)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
TRE3	Slightly silty coarse sand and shell gravel with many surface shells	Shells support sparse hydroid fauna including *Nemertesia ramosa*? (R) and serpulid worms. *Asterias rubens* (P). Much drift algae	SS.SCS.CCS		
TRE4	Gravelly muddy sand with sparsely scattered cobbles and boulders	The sediment supports terebellid worms (C), *Luidia ciliaris* (O), *Pecten maximus* (R), *Liocarcinus* sp.? (R), *Turritella* shells (R), *Echinus esculentus* (P) and *Munida sarsi* (O), whilst the stones provide a substrate for hydroids, orange bryozoans and *Sabella pavonina*?	SS.SSa.CMuSa		
TRE5	Boulders and cobbles on coarse sand/shell gravel with dense pebbles	Rock surfaces with dense cover of foliose and filamentous red algae. Poor visibility prevents detailed analysis but the more obvious elements include *Delesseria sanguinea*, *Plocamium cartilagineum* and *Dilsea carnosa*. Boulders are also encrusted with pink coralline and brown algae, *Parasmittina trispinosa* and sparse serpulid worms. *Echinus esculentus* (C), *Henricia* sp. (R), *Alcyonium digitatum* (R), small *Saccharina latissima* (O), *Cliona celata*? (R)	IR.HIR.KFaR.FoR		
TRE6	Coarse sand and gravel with pebbles, cobbles and occasional boulders	Little sign of life apart from encrustations of orange bryozoans (R) and *Spirobranchus* spp. (F) and hydroid (R) and red (R) and brown (R) algal patches and *Alcyonium digitatum* (R) on the larger stones. *Luidia ciliaris* (P), Asteroidea sp. indet (P)	SS.SCS.CCS		
TRE7	Boulders and cobbles on pebbly gravel substrate	Rock encrusted with *Spirobranchus* spp. (C), Cirripedia spp. (R), *Parasmittina trispinosa* (O) and pink coralline algae (R) and supporting a sparse yellow sponge fauna (R), including *Myxilla incrustans*?, and occasional *Caryophyllia smithii* and patches of erect bryozoans, probably *Securiflustra securifrons* (R). *Asterias rubens* (F), *Luidia ciliaris* (F), *Echinus esculentus* (F), *Porania pulvillus* (R), *Pentapora fascialis*? (R), *Porella compressa*? (R), hydroid clumps (R, including *Nemertesia ramosa*), *Munida sarsi* (R), *Cancer pagurus* (P), *Lanice conchilega* (O), Ascidiacea sp. (R)	CR.MCR.EcCr.FaAlCr		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
TRE7	Waves of coarse sand with pebbles and cobbles in the troughs	Stones encrusted with serpulid worms (probably dead)	SS.SCS.CCS		
TRE8	Soft mud	Mud perforated by abundant small burrows (1-9/0.01m^2), around 1 cm in diameter and sparse, small *Nephrops*-like burrows; small *Nephrops* present. No seapens definitely observed but visibility very poor	SS.SMu.CFiMu.SpnMeg	BM	Poor visibility and the resultant poor characterisation of the site makes biotope identification uncertain
TRN1	Fine-medium sand, in places formed into waves with broken shell in the troughs	Few signs of infaunal life apart from occasional emergent short tubes. *Callionymys* spp. (O), Pisces sp. (P), Paguridae sp. (R), *Asterias rubens* (R)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
TRN2	Coarse sand and gravel with pebbles, cobbles and boulders, interrupted by areas of coarse sand with gravel and pebbles, often formed into waves	Rock encrusted with *Spirobranchus* spp. (C), Parasmittina trispinosa (F) and Balanus spp. (P). Echinus esculentus (F), Munida sarsi (O), Marthasterias glacialis? (O), Asterias rubens? (P), Luidia ciliaris (P)	CR.MCR.EcCr.FaAlCr SS.SCS.CCS		
TRN3	Dense cobbles and occasional boulders and bedrock outcrops on coarse sand, with coarse sand patches	Rock encrusted with pink coralline algae (C), *Parasmittina trispinosa* (F), sponges (R) and serpulid worms including *Spirobranchus* spp. (C), and supporting sparse foliose red algae (R, locally F) and patches of *Clavelina lepadiformis* (R) and hydroids (R, including *Halecium halecinum*?). *Lanice conchilega* is present in the interstitial sand patches. *Echinus esculentus* (F), *Asterias rubens* (F), Asteroidea spp. indet (F), *Porania pulvillus* (R), *Urticina* spp. (R), *Scyliorhinus* sp. (P), *Calliostoma zizyphinum* (P)	CR.MCR.EcCr.FaAlCr SS.SCS.CCS		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
TRW1	Mostly dense cobbles and occasional boulders on pebbly sand, but with areas of rounded pebbles and patches of coarse sand	Cobbles and boulders encrusted with *Spirobranchus* spp. (C), other serpulids (P), and *Parasmittina trispinosa* (O). The boulders also support frequent *Caryophyllia smithii*. Brittlestars are locally abundant between the stones (*Ophiothrix fragilis* A, *Ophiocomina nigra* P). *Luidia ciliaris* (F), Asteroidea spp. indet (F), *Porania pulvillus* (O), *Echinus esculentus* (R), *Munida sarsi* (O), Veneridae sp. (P), hydroid clumps (R). The pebble patches appear fairly barren, apart from the presence of *Ophiura albida* (C)	CR.MCR.EcCr.FaAlCr SS.SCS.ICS.SSh SS.SCS.CCS		
TRW2	Dense cobbles and boulders	Cobbles and boulders encrusted with *Spirobranchus* spp. (C, locally A), other serpulids (P), *Parasmittina trispinosa* (F), red bryozoans (R) and pink coralline algae (R). The boulders also support a patchy hydroid turf (F), including *Kirchenpaueria pinnata*? (P), frequent *Caryophyllia smithii* and a sparse sponge fauna including *Cliona celata* (R), encrusting sponges (R) and a digitiform yellow form (R). *Echinus esculentus* (O), *Porania pulvillus* (O), *Asterias rubens* (O), *Henricia* spp. (O), Asteroidea spp. indet (O), *Luidia ciliaris* (P), *Ascidia mentula* (P), *Chaetopterus variopedatus* (P)	CR.MCR.EcCr.FaAlCr		
TRW3	Uneven bedrock	The camera straddles the lower boundary of a kelp park, dominated by small plants of *Laminaria hyperborea* (C), but also containing *Sacchoriza polyschides*. The kelp understorey community appears similar to the community below the kelp limit. The rock is encrusted with pink coralline algae (A) and supports a patchy algal turf, dominated by foliose and filamentous reds (C, locally S). The turf includes *Delesseria sanguinea*, *Dictyota dichotoma* and *Cryptopleura ramosa*?. The fauna is dominated by *Alcyonium digitatum* (F, locally C), *Echinus esculentus* (C), *Sagartia elegans* (F, locally C) and *Asterias rubens* (F)	IR.HIR.KFaR.LhypR.Pk IR.HIR.KFaR.FoR		Biotopes uncertain due to limited observation of the biota resulting from considerable camera movement

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
TRW4	Uneven bedrock with areas of boulders and sand patches	The camera straddles the lower infralittoral/upper circalittoral boundary, with areas of moderately dense foliose red algal cover (A) and scattered small kelp plants (probably largely *Laminaria hyperborea*, O) and areas strongly dominated by pink algal crusts. *Echinus esculentus* (C), *Asterias rubens* (C), *Alcyonium digitatum* (R, locally F), *Sagartia elegans* (P, locally F)	IR.HIR.KFaR.FoR CR.MCR.EcCr.FaAlCr		Biotopes uncertain due to limited observation of the biota resulting from considerable camera movement
TRW5	Boulders and cobbles on shell gravel with pebbles; also gravel/coarse sand patches with scattered pebbles and cobbles	Stones encrusted with *Parasmittina trispinosa* (O) and *Spirobranchus* spp. (C) and supporting very sparse sponge fauna including *Axinella infundibulum*? (R) and *Hymedesmia paupertas*? (R). *Echinus esculentus* (C), *Asterias rubens* (C), *Porella compressa* (C locally), *Munida sarsi* (R), *Calliostoma zizyphinum* (P), *Ophiothrix fragilis* (P), *Urticina* sp.? (R), *Luidia ciliaris* (P)	CR.MCR.EcCr.FaAlCr SS.SCS.CCS		
NIS1	Rippled fine sand	Little evidence of life. Pleuronectidae sp. (P), Asteroidea sp. (R)	SS.SSa.CFiSa		Lack of infaunal data renders the biotope identity uncertain
NIS2	Rippled fine sand	Fairly dense population of Cnidaria sp.? (C) - cf. *Corymorpha*	SS.SSa.CFiSa		Lack of infaunal data renders the biotope identity uncertain
NIS3	Slightly silty fine sand	Much richer than sites NIS1 and NIS2. Evidence of infaunal community includes bivalve siphons (C) and polychaete casts (F), whilst epifauna includes Cnidaria sp.? (C) and *Corystes cassivelaunus* (F). Teleostei sp. (P)	SS.SSa.CMuSa		Lack of detailed infaunal and particle size data renders the biotope identity uncertain

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
NIS4	Very slightly silty rippled fine sand	Similar to site NIS3 with bivalve siphons common, polychaete casts (F), Cnidaria sp.? (F), *Amphiura* spp. (F), *Ophiura ophiura*? (R), Asteroidea sp. (R), *Corystes cassivelaunus* (R)	SS.SSa.CMuSa		Lack of detailed infaunal and particle size data renders the biotope identity uncertain
NIS5	Rippled fine sand	Cnidaria sp.? (C), polychaete casts (C), bivalve siphons (O), *Corystes cassivelaunus* (O)	SS.SSa.CFiSa		Lack of detailed infaunal and particle size data renders the biotope identity uncertain
NIS6	Cobbles and small boulders on sand	Stones encrusted with yellow bryozoans (R, probably *Parasmittina trispinosa*) and supporting *Alcyonium digitatum* (R) and patches of *Flustra foliacea* (O). *Echinus esculentus* (C), Asteroidea sp. (P)	CR.MCR.EcCr.FaAlCr.Flu		
NIS6	Slightly rippled fine sand	Frequent polychaete casts	SS.SSa.CFiSa		Lack of infaunal data renders the biotope identity uncertain
NIS7	Bedrock and boulders	Rock encrusted with *Spirobranchus* spp (C, locally A) and orange bryozoans (R). Erect forms include *Alcyonium digitatum* (O), *Cliona celata* (R) and possibly *Caryophyllia smithii* (P). *Echinus esculentus* (C), Asteroidea spp. indet (F) including *Luidia ciliaris* (P)	CR.MCR.EcCr.FaAlCr		
NIS7	Waves of silty shell gravel with admixture of pebbles and shells, especially in troughs	Little evidence of life. *Ophiura albida* (P), *Asterias rubens* (P), *Cancer pagurus* (P)	SS.SCS.CCS		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
NIS8	Mostly bedrock with areas of boulders on bedrock and boulders on sand; some small sand gullies present	Rock encrusted with pink coralline (F) and red (R) algae, orange bryozoans (R) and *Spirobranchus* spp. (F) and supporting sparse *Alcyonium digitatum* (R), *Urticina felina* (R), *Halichondria panicea*? (R), *Cliona celata* (R), hydroid tufts (R) and erect red algae, including *Delesseria sanguinea* (R). The motile fauna is dominated over much of the run by *Ophiocomina nigra* (A), although density varies from absence to superabundance. *Echinus esculentus* (C), *Crossaster papposus* (F), *Marthasterias glacialis* (F), Asteroidea spp. indet (F), *Luidia ciliaris* (F), *Asterias rubens* (P), *Flustra foliacea* (R), *Gibbula* sp. (R), *Ophiopholis aculeata*? (P)	CR.MCR.EcCr.FaAlCr.Bri CR.MCR.EcCr.FaAlCr		
NIS9	Slightly silty rippled fine sand, becoming more mixed, with scattered pebbles at the end of the run	Little evidence of infaunal life. *Asterias rubens* (F), *Corystes cassivelaunus*? (P)	SS.SSa.CFiSa		Lack of infaunal and particle size data renders the biotope identity uncertain
MOK27	Heterogeneous substrate of pebbles and gravel, with a surface scatter of cobbles and boulders	Larger stones encrusted with pink coralline (C) and red (R) algae, *Spirobranchus* spp. (C), *Parasmittina trispinosa* (O) and red bryozoans (O) and supporting occasional clumps of *Flustra foliacea* and *Alcyonium digitatum* colonies. A sparse hydroid fauna includes *Nemertesia ramosa* (R) and *Abietinaria abietina*? (R). *Ophiocomina nigra* (locally A), *Echinus esculentus* (C), *Urticina felina* (F), *Calliostoma zizyphinum* (P), *Myxilla incrustans*? (R), yellow encrusting sponge (R), *Balanus* spp. (R), *Cancer pagurus* (F), *Asterias rubens* (F), *Crossaster papposus* (O)	SS.SMx.CMx.FluHyd		
MOK28	Plain of pebbles and gravel	Pebbles encrusted with pink coralline (C) and red (R) algae, *Spirobranchus* spp. (F) and *Balanus* spp. (R). Sparse attached fauna includes hydroid tufts (R) and *Flustra foliacea* (R and possibly drift). *Echinus esculentus* (C), *Asterias rubens* (C), *Urticina felina* (F)	SS.SCS.CCS.PomB		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
MOK29	Dense pebbles and shells on sand	Pebbles encrusted with *Spirobranchus* spp. (C) and supporting dense brittlestars (*Ophiothrix fragilis* S). *Echinus esculentus* (F), *Urticina felina* (P), *Crossaster papposus* (O), hydroids (O)	SS.SMx.CMx.OphMx		
MOK30	Pebbles, shells and gravel	Pebbles encrusted with *Spirobranchus* spp. (A, though many possibly dead), *Balanus* spp. (R), *Parasmittina trispinosa* (R) and red bryozoans (R) and supporting patches of *Flustra foliacea* (F), *Securiflustra securifrons* (O) and hydroids (O). *Ophiocomina nigra* (R), *Asterias rubens* (F), *Echinus esculentus* (O), patchy hydroid/bryozoan turf (locally A), *Chaetopterus variopedatus*? (R)	SS.SMx.CMx.FluHyd		
MOK31	Boulders, cobbles and pebbles and gravel	Stones encrusted with pink coralline (A) and red (R) algae, *Spirobranchus* spp. (F) and other serpulids (P) and *Parasmittina trispinosa* (R), and supporting dense brittlestars (*Ophiocomina nigra* A, *Ophiothix fragilis* A, *Ophiopholis aculeata* P) with the proportions of the species varying greatly regionally. *Alcyonium digitatum* (O), *Echinus esculentus* (C), *Asterias rubens* (O), *Urticina felina* (F), *Calliostoma zizyphinum* (F). Hydroid patches (O) include *Halecium halecinum*? (R)	SS.SMx.CMx.OphMx		
MOK32	Fine sand with scattered gravel, pebbles and sparse cobbles and boulders	Stones lightly encrusted with serpulid worms and supporting a fauna dominated by erect bryozoans, with patches of *Securiflustra securifrons* (F), *Flustra foliacea* (O), *Eucratea loricata*? (R), *Pentapora fascialis* (R) and *Alcyonidium diaphanum* (R). There are also clumps of hydroids, including *Halecium halecinum*? (R) and probably mixed clumps of hydroids and bryozoans (O). *Alcyonium digitatum* (R), *Polymastia boletiformis* (R), *Porania pulvillus* (R), *Urticina felina* (P)	SS.SMx.CMx.FluHyd		Also close to SS.SSa.IFiSa.ScupHyd

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T1	Soft mud	Mud perforated by abundant small burrows (1-9/0.01m^2), mostly up to around 1 cm in diameter and sparse *Nephrops*-like burrows; *Nephrops* present. The sea pen community includes a fairly high density of *Funiculina quadrangularis* (C) and occasional *Pennatula phosphorea*	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ	
T2	Mostly cobbles and boulders with some outcropping bedrock	Rock colonised by erect sponges (F), including *Axinella infundibuliformis/Phakellia ventilabrum* (F, locally A), encrusting sponges (R), *Caryophyllia smithii* (R), *Omalosecosa ramulosa* (F), patches of *Parazoanthus anguicomus* (O), *Swiftia pallida* (R) and a patchy hydroid turf (C) including *Tubularia indivisa*? (R). Motile forms include *Echinus esculentus* (R) and *Porania pulvillus* (O)	CR.HCR.DpSp	DS PA SP	
T3	Boulders and cobbles	Rock colonised by erect sponges (F) including *Axinella infundibuliformis/Phakellia ventilabrum* (F), *Raspailia* sp.? (P) and *Tetilla zetlandica*? (P) and patchy hydroid turf (F, but A in places), including large specimens of *Tubularia indivisa*? (locally C). Other sessile forms include encrusting sponges (R), *Porella compressa* (C), *Omalosecosa ramosa* (F), *Diazona violacea* (P), *Parazoanthus anguicomus* (R), Serpulidae spp. (R), *Filograna implexa*? (R) and *Bolocera tuediae*? (R). The motile fauna includes *Porania pulvillus* (F), *Echinus esculentus* (O), Asteroidea spp. indet. (O), *Labrus bimaculatus* (P) and Gadidae sp. (P). At the end of the run *Leptometra celtica* becomes abundant	CR.HCR.DpSp	DS PA	The abundance of hydroids, especially *Tubularia*? makes it a poor biotope fit
T3	Mixed sediment of muddy sand with gravel and pebbles, with occasional cobbles and boulders, becoming progressively muddier	Dense field of *Leptometra celtica* (A). In the muddier section there are numerous small sabellid-like tubes emerging from the sediment (locally A) and *Amphiura* sp. arms (locally C), together with *Pachycerianthus multiplicatus* (R) and occasional burrows. *Porania pulvillus* (R), *Reteporella beaniana* (R), *Ophiura albida* (R), *Callionymus* sp. (R)	SS.SMx.OMx	LC PM	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T4	Mostly bedrock but with areas of boulders and cobbles	Rock supports dense *Corynactis viridis* (C), with *Caryophyllia smithii* occasional but becoming common in deeper water. Encrusting sponges (F) include yellow, red and beige forms, while erect species include *Phakellia ventilabrum/Axinella infundibuliformis* (F). The hydroid fauna (O) includes *Halecium halecinum*? (R) and *Tubularia indivisa*? (R). Other sessile species are *Diazona violacea* (F) and, in shallower water, pink coralline algae (locally O). The motile component includes *Porania pulvillus* (F), *Asterias rubens* (O), *Henricia* sp. (R), *Echinus esculentus* (F), *Calliostoma zizyphinum* (P) and *Taurulus bubalis* (P)	CR.MCR.EcCr.CarSp.PenPcom		Also close to CR.HCR.XFa.CvirCri
T4	Cobbles and boulders	Fauna dominated by sponges and bryozoans, with *Phakellia ventilabrum/Axinella infundibuliformis* (F), *Porella compressa* (F), *Omalosecosa ramulosa* (F) and *Reteporella beaniana* (R). *Filograna implexa*? (P), *Diazona violacea* (P), hydroid patches (O) including *Tubularia indivisa*? (R), encrusting sponges (O). Dense patches of *Leptometra celtica* towards the end of the run	CR.HCR.DpSp	DS	
T4	Muddy mixed sediment with gravel and pebbles and initially cobbles	A field of abundant *Leptometra celtica* with occasional *Pachycerianthus multiplicatus* and *Phakellia ventilabrum/Axinella infundibuliformis*	SS.SMx.OMx	LC PM	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T5	Cobbles and boulders with area of creviced bedrock	Rock supports frequent erect sponges including *Phakellia ventilabrum/Axinella infundibuliformis* (F), *Tetilla zetlandica*? (P) and *Raspailia* sp.? (P), with encrusting species including *Hymedesmia paupertas*? (R). A bryozoan fauna includes *Omalosecosa ramulosa* (F), *Reteporella beaneana* (R) and red encrusters (R). A patchy hydroid turf (F), includes *Tubularia indivisa* (locally F). There are patches of dense *Swiftia pallida* (R, locally A), *Caryophyllia smithii* (R, locally C) and *Corynactis viridis* (R, locally F). Motile species include *Porania pulvillus* (F), *Henricia* sp.? (O), *Munida sarsi* (P) and *Echinus esculentus* (R). Other sessile forms are *Diazona violacea* (P) and *Parazoanthus anguicomus* (R). *Leptometra celtica* becomes abundant at the end of the run	CR.HCR.DpSp	DS SP PA	Areas of dense *Swiftia* approach CR.HCR.XFa.SwiLgAs
T5	Gravelly muddy sand with scattered cobbles	A field of abundant *Leptometra celtica* with *Munida sarsi* (P) and *Porania pulvillus* (P)	SS.SMx.OMx	LC	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T6	Cobbles, boulders and fissured bedrock	Rock supports a diverse biota. Erect sponges include *Phakellia ventilabrum/Axinella infundibuliformis* (C, locally A), *Tetilla zetlandica*? (P), *Iophon* sp.? (R) and *Raspailia* sp.? (P), with encrusting species (O) including *Hymedesmia paupertas* (R). A patchy hydroid turf (F) includes *Kirchenpaueria pinnata*? (R), *Nemertesia ramosa* (R) and *Tubularia indivisa*? (P), while bryozoans include *Porella compressa* (F), *Omalosecosa ramulosa* (P), *Reteporella beaniana* (P) and *Parasmittina trispinosa*? (R). *Caryophyllia smithii* is generally frequent but becomes dense in places (A), often in association with concentrations of *Swiftia pallida* (R, but locally C). *Corynactis viridis* becomes frequent in shallower water. Other sessile species include *Filograna implexa*? (P), *Parazoanthus anguicomus* (R), *Diazona violacea* (P) and pink coralline algae (R). The motile community includes *Porania pulvillus* (F), *Echinus esculentus* (O), Asteroidea spp. indet. (F) and *Ctenolabrus rupestris* (P)	CR.HCR.DpSp	DS SP PA	Areas of dense *Swiftia* and *Caryophyllia* could be ascribed to CR.HCR.XFa.SwiLgAs
T7	Slightly rippled muddy sand	Sediment perforated by many small burrows and supporting *Leptometra celtica* (C)	SS.SSa.OSa	LC	
T7	Muddy mixed sediment with gravel, pebbles and cobbles	Abundant *Leptometra celtica* for most of run, with occasional *Pachycerianthus multiplicatus*, frequent *Munida sarsi* and sparse erect sponges and *Stichopus tremulus*	SS.SMx.OMx	LC PM	
T8	Muddy sand	Occasional small burrows and *Leptometra celtica*. *Pennatula phosphorea* (R), *Porania pulvillus*? (F)	SS.SSa.OSa		
T8	Gravelly muddy sand with scattered pebbles, cobbles and occasional boulders	Dense *Leptometra celtica* (A) with stones supporting occasional erect sponges and a patchy hydroid turf. *Reteporella beaniana* (P), *Munida sarsi* (F), Actiniaria sp. (O)	SS.SMx.OMx	LC	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T8	Dense cobbles and boulders interrupted by passage over extensive bedrock feature	Erect sponges common, including *Phakellia ventilabrum/Axinella infundibuliformis* (F, locally C) and *Raspailia* sp.? (P), with encrusting species (O) including *Hymedesmia paupertas*? (R). Hydroid patches (F) include *Halecium halecinum*? (P) and the bryozoan fauna includes *Reteporella beaniana* (F), *Omalosecosa ramulosa* (F) and *Parasmittina trispinosa*? (R). There are dense patches of *Swiftia pallida* (locally A), and of *Leptometra celtica* (locally A) at the end of the run. *Caryophyllia smithii* (R), *Parazoanthus anguicomus* (R), *Diazona violacea* (F), *Porania pulvillus* (F), Asteroidea spp. indet. (P), *Munida sarsi* (P), Pleuronectiformes sp. (P)	CR.HCR.DpSp	DS SP PA	
T8	Gravelly muddy sand with some scattered pebbles, cobbles and boulders	Dense *Leptometra celtica* (A) with occasional *Pachycerianthus multiplicatus* and *Munida sarsi*	SS.SMx.OMx	LC PM	
T9	Scattered cobbles and boulders on gravelly muddy sand but with areas devoid of stones	Fauna strongly dominated by erect sponges, especially *Phakellia ventilabrum/Axinella infundibuliformis* (C); *Tetilla zetlandica*? (P). Other sessile species include encrusting sponges (O), *Pachycerianthus multiplicatus* (O), *Swiftia pallida* (R), *Omalosecosa ramulosa* (R), *Parazoanthus anguicomus* (R) and Actiniaria sp. (P). Motile species include *Porania pulvillus* (F), *Luidia ciliaris* (P), Asteroidea spp. indet. (R), *Echinus esculentus* (O) and *Munida sarsi* (O)	CR.HCR.DpSp SS.SMx.OMx	DS PM SP PA	
T10	Dense cobbles with some boulders on gravelly muddy sand but with areas devoid of stones	Fauna strongly dominated by erect sponges, especially *Phakellia ventilabrum/Axinella infundibuliformis* (C); *Tetilla zetlandica*? (O). Other sessile species include encrusting sponges (R) including *Hymedesmia paupertas*? (R), *Omalosecosa ramulosa* (R), *Parazoanthus anguicomus* (R) and occasional hydroids. Motile species include *Porania pulvillus* (F), Asteroidea spp. indet. (O), *Echinus esculentus* (O) and *Munida sarsi* (F)	CR.HCR.DpSp SS.SMx.OMx	DS PA	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T11	Dead coral rubble on muddy sediment with scattered cobbles and boulders towards the end of the run	Rubble densely colonised by *Parazoanthus anguicomus*) (C) with occasional encrusting sponges and erect sponges including *Phakellia ventilabrum/Axinella infundibuliformis* (O). *Pachycerianthus multiplicatus* (R) , sabellid worms (O), *Parastichopus tremulus*? (R), *Porania pulvillus* (F), Asteroidea spp. indet. (F), *Munida sarsi* (C)	SS.SBR.Crl	PA PM	Poor biotope fit as the habitat is structured by dead coral
T12	Dead coral framework and rubble with sediment infill	Dead coral colonised by abundant *Parazoanthus anguicomus*, sabellid polychaete tubes (F), erect and encrusting sponges (F), including *Hymedesmia paupertas*? (P), *Omalosecosa ramulosa*? (F) and *Caberia ellisii* (F). *Porania pulvillus* (F), *Asterias rubens*? (P), *Munida sarsi* (O)	SS.SBR.Crl	PA	
T12	Lophelia reef framework (upstanding dead coral and live colonies) with sediment infill in places	*Lophelia pertusa* (F) with reefs supporting sabellid polychaetes (F, locally A), hydroid tufts (P), *Reteporella beaniana*? (P), *Antedon* sp.? (R), *Munida sarsi* (O) and dense ophiuroids (locally A). *Parazoanthis anguicomus* abundant on dead reef material. *Caberia ellisii* (P)	SS.SBR.Crl.Lop	CR PA	
T12	Mud	*Pachycerianthus multiplicatus* (F), *Parastichopus tremulus*? (P). Areas of softer sediment support dense *Amphiura* spp. (locally A) and are punctured by c. 1 cm diameter burrows (C). Rubble supports hydroid patches (O), *Omalosecosa ramulosa*? (R) and *Parazoanthus anguicomus* (R). *Munida sarsi* (F)	SS.SMu.OMu	PM PA	Poor biotope fit as the scattered rubble significantly influences the community
T12	Mixed muddy sediment with scattered cobbles, boulders and coral rubble	Cobbles and boulders support encrusting and erect sponges (F), including *Axinella infundibuliformis/Phakellia ventilabrum*? (O), *Filograna implexa*? (O), *Antedon* sp.? (R), *Omalosecosa ramulosa* (P) and sabellids (P). Mixed sediment supports *Pachycerianthus multiplicatus* (F), Actiniaria sp. (F), *Parastichopus tremulus*?, *Munida sarsi* (F) and *Porania pulvillus* (P)	SS.SMx.OMx CR.HCR.DpSp	DS PM	Poor fit but probably best available

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T13	Lophelia reef framework (upstanding dead coral and live colonies) with sediment infill in places	*Parazoanthus anguicomus* (A, locally S), *Lophelia pertusa* (O), *Munida sarsi* (F), sabellid polychaete tubes (F), *Pachycerianthus multiplicatus* (O), erect (O) and encrusting (F) sponges, including *Axinella infundibuliformis/Phakellia ventilabru*m? (P), *Cliona celata*? (P) and *Hymedesmia paupertas*? (R). A bryozoan fauna includes *Omalosecosa ramulosa*? (F), *Flustra foliacea*? (R) and *Caberia ellisii* (P). *Porania pulvillus* (F), hydroid tufts (P), *Filograna implexa*? (O), terbellid worms (P)	SS.SBR.Crl.Lop	CR PA PM	
T14	Lophelia reef framework (upstanding dead coral and live colonies) with sediment infill in places	*Parazoanthus anguicomus* (A, locally S), *Lophelia pertusa* (O), *Munida sarsi* (F), sabellid polychaete tubes (F), erect (O) and encrusting (F) sponges, including *Cliona celata*? (P) and *Axinella infundibuliformis/Phakellia ventilabrum*? (P). *Polycarpa pomaria*? (F), *Porania pulvillus* (P), *Omalosecosa ramulosa*? (F), hydroid patches (P), *Flustra foliacea*? (R)	SS.SBR.Crl.Lop	CR PA	
T15	Gravelly muddy sand (in places apparently as a thin veneer over rock) with bands of cobbles and boulders and initially sparse coral rubble	Abundant *Leptometra celtica* for most of the run, with Actiniaria sp. (F) and *Munida sarsi* (F). Stone bands support encrusting sponges (O) including *Hymedesmia paupertas*? (R), erect sponges (F) including *Phakellia ventilabrum/Axinella infundibuliformis* (F), *Parazoanthus anguicomus* (F), *Omalosecosa ramulosa* (F), *Reteporella beaniana* (F), *Filograna implexa*? (R), sabellids (R), serpulids (R) and occasional hydroids, including *Tubularia indivisa*? (R). Ophiuroidea sp. (R), *Eledone cirrhosa* (R), *Porania pulvillus* (O), Asteroidea spp. indet. (P), *Echinus esculentus* (R)	SS.SMx.OMx CR.HCR.DpSp	DS LC PA	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T16	Sediment-dusted smooth bedrock	Low-diversity fauna dominated by dense erect sponges (C), mostly *Phakellia ventilabrum/Axinella infundibuliformis* (C, but A in places), dense but fairly small *Swiftia pallida* (C, locally A) and *Leptometra celtica* (C, locally A). Other taxa include occasional encrusting sponges, *Porania pulvillus* (P), Asteroidea spp. indet. (O) and *Luidia ciliaris*? (R)	CR.HCR.DpSp	DS SP	
T16	Muddy sand with gravel and pebbles and scattered cobbles and boulders	Fauna dominated by dense *Leptometra celtica* (A), with occasional *Porania pulvillus* and *Munida sarsi* and sparse *Pachycerianthus multiplicatus* (R). Scattered stones also support sparse Pha*kellia ventilabrum/Axinella infundibuliformis* (R) and *Tetilla zetlandica*? (R), encrusting sponges (R) including *Hymedesmia paupertas*?, *Parazoanthus anguicomus* (R), serpulids (R) and *Ophiothrix fragilis*? (R)	SS.SMx.OMx	LC PM PA	
T16	Sediment-dusted smooth bedrock	Very low-diversity fauna dominated by dense *Leptometra celtica* (A). *Phakellia ventilabrum/Axinella infundibuliformis* is occasional but mostly as small specimens (F locally). *Porania pulvillus* (R), Asteroidea spp. indet. (O)	CR.HCR.DpSp	DS	Poor example of the biotope
T16	Cobbles and pebbles on muddy sand	*Leptometra celtica* (F), *Munida sarsi* (F), *Reteporella beaniana*? (R), serpulids (R), *Parazoanthus anguicomus* (R), *Phakellia ventilabrum/Axinella infundibuliformis* (R), encrusting sponges (R), *Porania pulvillus* (R)	SS.SMx.OMx	LC PA	
T17	Gravelly muddy sand with scattered pebbles and cobbles	Occasional *Pachycerianthus multiplicatus* and *Porania pulvillus*, with sparse *Parazoanthus anguicomus* (R) and *Omalosecosa ramulosa*? (R) on stones. Asteroidea sp. Indet. (R)	SS.SMx.OMx	PM PA	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T17	Outcropping silted bedrock and dense cobbles and boulders	Fauna strongly dominated by erect sponges, especially *Phakellia ventilabrum/Axinella infundibuliformis* (C, locally A); *Tetilla zetlandica*? (O). *Swiftia pallida* occurs in dense patches (C, but F overall) on the bedrock. Other sessile species are encrusting sponges (O) including *Hymedesmia paupertas*? (R), *Omalosecosa ramulosa* (F), *Reteporella beaniana* (F but locally C), *Parazoanthus anguicomus* (R), *Caryophyllia smithii* (R) and hydroid patches. The motile component includes *Parastichopus tremulus*? (R), Neogastropoda sp. (R), *Porania pulvillus* (F), Asteroidea spp. indet. (F) and *Munida sarsi* (P)	CR.HCR.DpSp	DS SP PA	
T17	Mud with scattered cobbles	The mud contains many small burrows c. 0.3-1.0 cm in diameter (around 1-9/0.1 m^2) and occasional *Nephrops*-like larger burrows and frequent *Funiculina quadrangularis*. *Leptometra celtica* is frequent overall but abundant in patches, especially in areas of denser stones. *Pachycerianthus multiplicatus* (R), *Cerianthus lloydii*? (R), *Porania pulvillus* (O), *Munida sarsi* (F)	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ LC PM	
T18	Mud	Densely burrowed mud with most burrows c. 0.5-1.0 cm in diameter (1-9/0.1m^2), but some larger burrows also present and a dense surface scattering of small faunal tubes. *Funiculina quadrangularis* (O), *Cerianthus lloydii*? (R)	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T19	Bedrock, boulders and cobbles with sediment pockets and an area of poorly sorted gravelly muddy sand with scattered pebbles and cobbles and cobble patches towards the end of the run	Fauna strongly dominated by erect sponges, especially *Phakellia ventilabrum/Axinella infundibuliformis* (C, locally A) with *Tetilla zetlandica*? (O) and *Polymastia boletiformis* (R). *Swiftia pallida* is common on the bedrock. Other sessile species are encrusting sponges (O), *Omalosecosa ramulosa* (O), *Reteporella beaniana* (P), *Parazoanthus anguicomus* (O), *Caryophyllia smithii* (R), serpulids (R) and hydroid patches (O). The motile component includes *Porania pulvillus* (F), *Luidia ciliaris* (R), Asteroidea spp. indet. (P), *Echinus esculentus* (O) and *Munida sarsi* (P)	CR.HCR.DpSp SS.SMx.OMx	DS SP PA	
T20	Initially steep rock face, then dense boulders and cobbles with areas of bedrock and some patches of sediment, possibly superficial	Fauna strongly dominated by erect sponges, especially *Phakellia ventilabrum/Axinella infundibuliformis* (C, locally A) with *Tetilla zetlandica*? (F). Encrusting sponges (O) include *Hymedesmia paupertas* (R). *Swiftia pallida* is common and there is a patchy hydroid turf (O) including *Nemertesia ramosa* (R) and *N. antennina*? (R). The bryozoan fauna includes *Reteporella beaniana* (F) and *Omalosecosa ramulosa* (F). Other sessile species are *Parazoanthus anguicomus* (O), *Caryophyllia smithii* (O) and serpulids (R), . The motile fauna includes *Porania pulvillus* (F), *Labrus bimaculatus* (O), Asteroidea spp. indet. (F) and *Echinus esculentus* (R)	CR.HCR.DpSp	DS SP PA	
T20	Muddy sand with very sparsely scattered cobbles and boulders	Sparse small burrows, *Pennatula phosphorea* (R) and *Porania pulvillus* (R). Sparse *Swiftia pallida* (R) and hydroid clumps (R) suggest sediment cover is thin, at least in places	SS.SSa.OSa		

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T20	Dense cobbles and occasional boulders	Erect sponges common, including *Phakellia ventilabrum/Axinella infundibuliformis* (C). Other sessile forms include *Omalosecosa ramulosa* (F), *Reteporella beaniana* (P), hydroid patches (O) and Holothuroidea sp. (R), while motile species include *Porania pulvillus* (P), Asteroidea spp. indet. (O), *Echinus esculentus* (R), *Munida sarsi* (P), Pleuronectiformes sp. (R) and *Lophius piscatorius* (P)	CR.HCR.DpSp	DS	
T20	Slightly rippled muddy sand with sparse cobbles	Sparse small burrows, *Pennatula phosphorea* (R), *Munida sarsi* (O), *Ophiura* sp.? (R), *Callionymus* sp. (R) and *Luidia ciliaris* (R). Sparse rock supports *Swiftia pallida* (R), *Reteporella beaniana* and *Phakellia ventilabrum/Axinella infundibuliformis* (R)	SS.SSa.OSa		
T21	Fairly smooth bedrock slope, steep in places, with boulders and cobbles in places	Dense *Leptometra celtica* (A) with small frequent erect sponges (chiefly *Phakellia ventilabrum/Axinella infundibuliformis*) in shallow water, but becoming common with increasing depth (C overall); *Tetilla zetlandica*? (O). *Swiftia pallida* (R), *Filograna implexa*? (R), *Reteporella beaniana* (F), hydroids (O), *Parazoanthus anguicomus* (R), *Urticina* sp.? (R). Occasional encrusting sponges; *Cliona celata*? (R). Motile species are *Porania pulvillus* (F), *Ophiura albida* (C, at least locally) and *Echinus esculentus* (R)	CR.HCR.DpSp	DS SP PA	
T21	Possibly initially muddy sand but certainly developing into soift mud with increasing depth	Burrows initially sparse but softer mud densly burrowed, with frequent *Nephrops* burrows; *N. norvegicus* (P) and occasional *Funiculina quadrangularis* and dense small faunal tubes. *Leptometra celtica* (C) but abundant in places, absent in others. *Callionymus* sp. (R), Brachyura sp. (R), *Parastichopus tremulus*? (R), *Munida sarsi* (O), Actiniaria sp. (R)	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ LC	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T22	Sediment-dusted smooth flat rock with dense cobble patches	Flat rock supporting low-diversity fauna dominated by small erect sponges (mostly *Phakellia ventilabrum/Axinella infundibuliformis* - C) and small *Swiftia pallida* (C); with richer fauna in the cobble areas. Other sessile species include *Reteporella beaniana* (O), *Omalosecosa ramulosa* (F), *Parasmittina trispinosa*? (R), *Serpula vermicularis* (R), hydroids (O) including *Nemertesia ramosa* (R), *Parazoanthus anguicomus* (R), encrusting sponges (O) including *Hemedesmia paupertas* (R), *Diazona violacea* (R) and Actiniaria sp. (R). The motile fauna includes *Porania pulvillus* (F), *Munida sarsi* (O), *Luidia ciliaris* (R), Asteroidea spp. indet. (O), *Echinus esculentus* (R), *Ophiura albida* (R), *Ophiothrix fragilis*? (R), *Parastichopus tremulus*? (O), *Callionymus* sp. (R) and *Ctenolabrus rupestris* (R)	CR.HCR.DpSp	DS SP PA	A poor representation of the biotope
T23	Mud	Mud perforated by many small burrows (<1 cm diameter) and occasional *Nephrops* burrows and supporting fairly numerous population of *Funiculina quadrangularis* (C). *Parastichopus tremulus* (R), *Pachycerianthus multiplicatus* (R)	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ PM	
T23	Mud or muddy sand with scattered cobbles and boulders	Dense *Leptometra celtica* (A) with occasional *Parastichopus tremulus*, *Porania pulvillus* and *Munida sarsi*. *Pachycerianthus multiplicatus* (R), *Bolocera tuediae*? (R), Actiniaria sp. (R), Asteroidea spp. Indet. (R), Holothuroidea sp. (R)	SS.SMu.OMu	LC PM	
T24	Gravelly muddy sediment with sparsely scattered cobbles and boulders	Dense *Leptometra celtica* (A) with *Parastichopus tremulus* (O) and *Pachycerianthus multiplicatus* (F). Stones support erect sponges including *Phakellia ventilabrum/Axinella infundibuliformis* (P) and *Polymastia boletiformis*? (P), the bryozoans *Reteporella beaniana* (P) and *Omalosecosa ramulosa* (P), and *Parazoanthus anguicomus* (P)	SS.SMx.OMx	LC PA	

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T24	Dense cobbles and boulders with areas of bedrock	*Leptometra celtica* common overall, although abundant over extensive areas. Erect sponges common overall, although at low density for the first part of the run; dominant species include *Phakellia ventilabrum/Axinella infundibuliformis* (C). The sparse encrusting sponge fauna includes *Hymedesmia paupertas* (R). Other sessile species include *Filograna implexa*? (R), *Reteporella beaniana* (F), *Omalosecosa ramulosa* (F), hydroids (O), *Parazoanthus anguicomus* (R), *Bolocera tuediae*? (O) and *Pachycerianthus multiplicatus* (O), with motile species including *Parastichopus tremulans* (O), *Porania pulvillus* (F) and Asteroidea spp. indet. (O)	CR.HCR.DpSp	DS PA PM	
T24	Mud wth sparse cobbles and boulders towards the end of the run	Dense field of *Leptometra celtica* (A) with sparse small burrows and occasional *Pachycerianthus multiplicatus*. Stones support sparse erect sponges (R)	SS.SMu.OMu	LC PM	
T25	Mud with scattered cobbles and boulders	Areas of softer mud with dense small burrows (<1 cm in diameter) and numerous *Funiculina quadrangularis* (C), although only frequent overall. *Pennatula phosphorea* (R), *Cerianthus lloydii*? (R), *Pachycerianthus multiplicatus* (F). Stones support sparse sponges. *Munida sarsi* (O), Actiniaria sp. (R)	SS.SMu.CFiMu.SpnMeg.Fun	BM FQ PM	Not typical of the biotope, in particular lacking larger burrowing species and having scattered stones
T25	Gravelly muddy sediment with scattered cobbles and boulders	Sediment with occasional *Funiculina quadrangularis* and possibly *Pennatula phosphorea*, with *Pachycerianthus multiplicatus* (R) and Actinaria sp.? (O). Stones support occasional erect sponges including *Phakellia ventilabrum/Axinella infundibuliformis* (O), *Parazoanthus anguicomus* (P), *Omalosecosa ramulosa* (P), *Reteporella beaniana* (P) and *Filograna implexa*? (R), with motile species including *Echinus esculentus* (R), Asteroidea spp. indet. (O) and *Munida sarsi* (O). A dense patch of *Leptometra celtica* (A) at the end of the run	SS.SMx.OMx	PM PA LC	Not a good biotope fit

Appendix 2 continued

Site ID	Substrate	Biota	Biotope	PMF	Comments
T26	Coral rubble and upstanding dead reef framework on muddy sediment	Dead coral supports fairly dense *Parazoanthus anguicomus* (C), with *Sabella* spp. (F), *Filograna implexa*? (O), hydroids (O), *Omalosecosa ramulosa* (P), occasional erect sponges (including *Phakellia ventilabrum/Axinella infundibuliformis*, O), encrusting sponges (R), *Cliona celata*? (R) and Actiniaria sp. (O). Motile species include Asteroidea spp. indet. (O), *Echinus esculentus (*P) and *Munida sarsi* (O)	SS.SBR.Crl	PA	
T26	Gravelly muddy sediment with scattered cobbles and boulders	*Leptometra celtica* (C, though A over an extensive area) with *Sabella* spp. (R), *Pachycerianthus multiplicatus* (R), Actiniaria sp. (F) and burrowing anemone (R). Stones support the bryozoans *Caberia ellisii* (P), *Omalosecosa ramulosa* (P) and *Reteporella beaniana* (P), erect sponges (R) including *Phakellia ventilabrum/Axinella infundibuliformis* (R), encrusting sponges (R), *Cliona celata*? (R), *Filograna implexa*? (O), serpulids (O), *Parazoanthus anguicomus* (R) and *Bolocera tuediae*? (R). The motile fauna includes *Porania pulvillus* (F), Asteroidea spp. indet. (O), Ophiuroidea sp. (R), *Echinus esculentus* (R) and *Munida sarsi* (C)	SS.SMx.OMx	LC PM PA	

Appendix 3 Biotopes recorded with sites of occurrence and illustrative photograph or video frame grab**.** Biotope codes in red are PMFs. Italicised sites indicate provenance of image

Biotope and Sites	Photograph
IR.HIR.KFaR.LhypR.Pk *Laminaria hyperborea* park with dense foliose red seaweeds on exposed lower infralittoral rock *TRW3* Image: video	
IR.HIR.KFaR.FoR Foliose red seaweeds on exposed lower infralittoral rock TRE5, *TRW3*, TRW4 Image: 9711	
IR.HIR.KSed.LsacSac *Laminaria saccharina* and/or *Saccorhiza polyschides* on exposed infralittoral rock *SR22* Image: video	

Table 13.2 continued

Biotope and Sites	Photograph
IR.MIR.KR.Lhyp.Ft *Laminaria hyperborea* forest and foliose red seaweeds on moderately exposed upper infralittoral rock *WMO27*, WMO28 Image: video	
IR.MIR.KR.Lhyp.Pk *Laminaria hyperborea* park and foliose red seaweeds on moderately exposed lower infralittoral rock *LW10*, WMO24, WMO27, WMO28 Image: Lewis TV Run 10 533	
IR.MIR.KR.LhypT.Pk *Laminaria hyperborea* park with hydroids, bryozoans and sponges on tide-swept lower infralittoral rock *KR2/10*, KR3/10 Image: 9519	

Table 13.2 continued

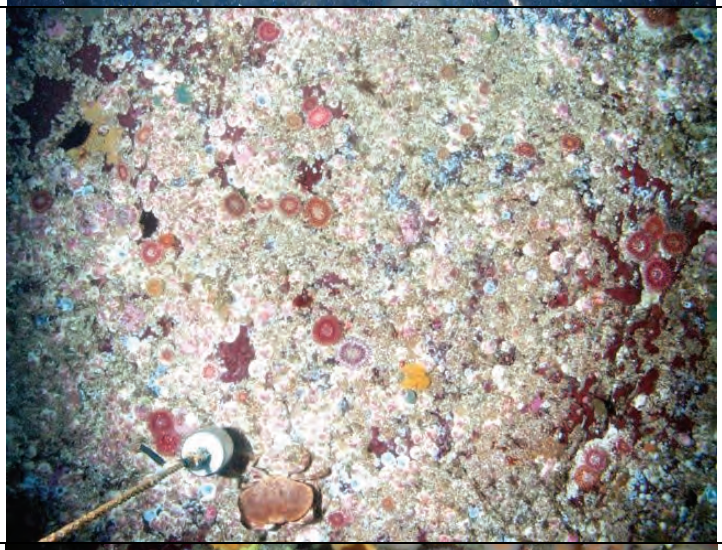
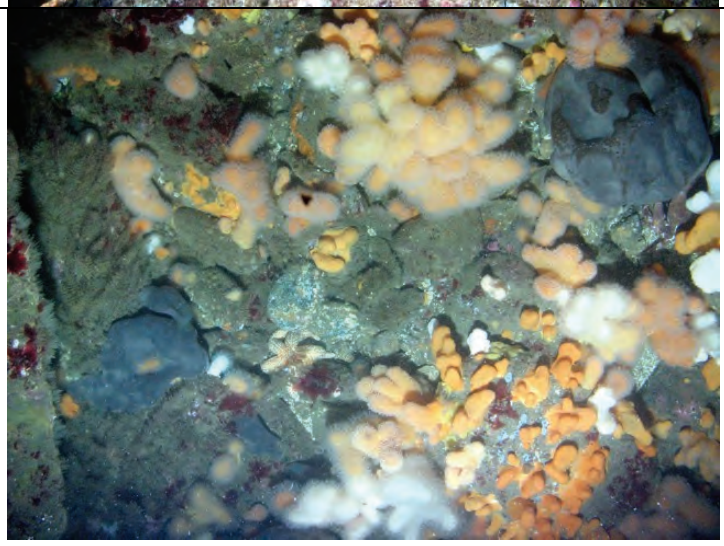
Biotope and Sites	Photograph
IR.MIR.KR.LhypTX.Pk *Laminaria hyperborea* park and foliose red seaweeds on tide-swept, lower infralittoral mixed substrata *KR2/10* Image: 9521	
CR.HCR.FaT.CTub *Tubularia indivisa* on tide-swept circalittoral rock NW3, *SOS1/09*, SOS1/10, SOS2/10 Image: 6905	
CR.HCR.FaT.CTub.Adig *Alcyonium digitatum* with dense *Tubularia indivisa* and anemones on strongly tide-swept circalittoral rock KR1/09, *KR3/10* Image: 9542	

Table 13.2 continued

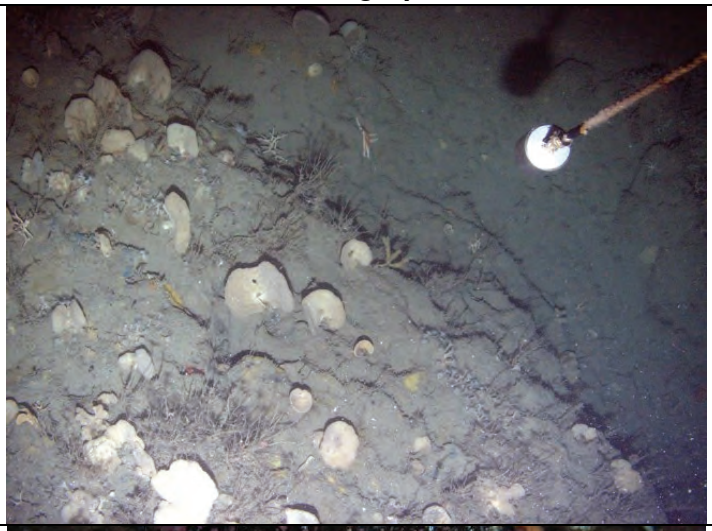
Biotope and Sites	Photograph
CR.HCR.DpSp Deep sponge communities *T2*, T3, T4, T5, T6, T8, T9, T10, T12, T15, T16, T17, T19, T20, T21, T22, T24 Image: 8706	
CR.HCR.XFa.CvirCri *Corynactis viridis* and a mixed turf of crisiids, *Bugula*, *Scrupocellaria*, and *Cellaria* on moderately tide-swept exposed circalittoral rock *FITV37* Image: Fair Isle TV Run 37 1999	
CR.MCR.EcCr.CarSp.Bri Brittlestar bed overlying coralline crusts, *Parasmittina trispinosa* and *Caryophyllia smithii* on wave-exposed circalittoral rock *LW3*, LW7 Image: Lewis TV Run 3 398	

Table 13.2 continued

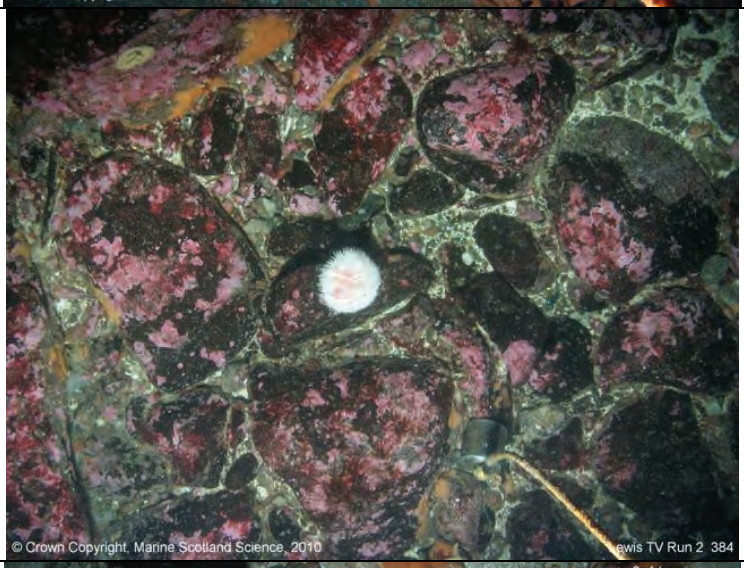
Biotope and Sites	Photograph
CR.MCR.EcCr.CarSp.PenPcom *Caryophyllia smithii* and sponges with *Pentapora foliacea*, *Porella compressa* and crustose communities on wave-exposed circalittoral rock LW27, *LW31*, T4 Image: Lewis Run 31 924	
CR.MCR.EcCr.FaAlCr Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock KR2/10, *LW2*, LW5, LW8, LW9, LW10, LW15, LW19, LW25, NH22/D1, NH22/D3, NH22/D5, NH22/D6, NIS7, NIS8, SR27, SR28, SR31, TRE2, TRE7, TRN2, TRN3, TRW1, TRW2, TRW4, TRW5, WMO21, WMO24, WMO24, WMO28, WMO37, WMO38, WMO39, WMO40 Image: Lewis TV Run 2 384	
CR.MCR.EcCr.FaAlCr.Adig *Alcyonium digitatum*, *Pomatoceros triqueter*, algal and bryozoan crusts on wave-exposed circalittoral rock *FITV45*, WMO28 Image: Fair Isle TV Run 45 1105	

Table 13.2 continued

Biotope and Sites	Photograph
CR.MCR.EcCr.FaAlCr.Bri Brittlestar bed on faunal and algal encrusted, exposed to moderately wave-exposed circalittoral rock FITV45, LW4, LW5, LW6, LW8, *LW11*, LW12, LW13, LW14, LW15, LW16, LW17, LW18, LW19, LW20, LW21, LW22, LW23, LW24, LW25, LW26, LW28, LW34, LW35, LW36, NH22/D3, NIS8, WMO32 Image: Lewis TV Run 11 545	
CR.MCR.EcCr.FaAlCr.Car *Caryophyllia smithii* with faunal and algal crusts on moderately wave-exposed circalittoral rock LW7, WMO22, WMO23, WMO40, WMO41, *WMO43*, WMO44 Image: West Mainland Orkney TV Run 43 1519	
CR.MCR.EcCr.FaAlCr.Flu *Flustra foliacea* on slightly scoured silty circalittoral rock FITV38, *LW30*, NIS6, WMO24, WMO28, WMO29, WMO30, WMO31, WMO32, WMO34, WMO44, WMO45, WMO46 Image: Lewis Run 30 905	

Table 13.2 continued

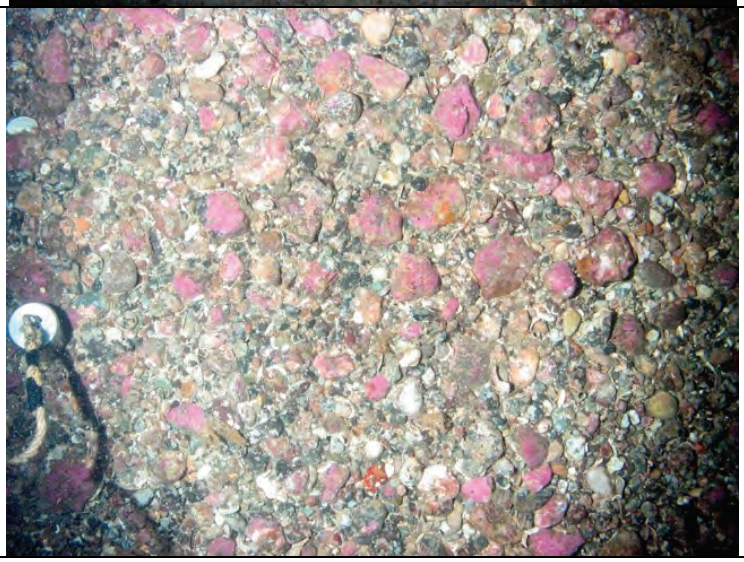
Biotope and Sites	Photograph
CR.MCR.EcCr.FaAlCr.Pom Faunal and algal crusts with *Pomatoceros triqueter* and sparse *Alcyonium digitatum* on exposed to moderately wave-exposed circalittoral rock LW28, *LW30*, WMO24 Image: Lewis Run 30 903	
SS.SCS.CCS Circalittoral coarse sediment FITV39, FITV40, FITV41, LW28, NH22/D1, NH22/D4, NH22/D6, NIS7, SOS1/09, SOS2/09, *SOS3/10*, SR31, TRE3, TRE6, TRE7, TRN2, TRN3, TRW1, TRW5, WMO32, WMO36, WMO40, WMO41 Image: 0160	
SS.SCS.CCS.PomB *Pomatoceros triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles KR1/10, *MOK28* Image: 7194	

Table 13.2 continued

Biotope and Sites	Photograph
SS.SCS.ICS.SSh Sparse fauna on highly mobile sublittoral shingle (cobbles and pebbles) *TRW1* Image: 9686	
SS.SSa.CFiSa Circalittoral fine sand FITV38, FITV42, FITV43, FITV44, LW7, LW16, LW17, LW27, LW29, LW31, LW32, LW33, NIS1, NIS2, NIS5, NIS6, NIS9, SR11, SR12, SR14, *SR15*, SR16, SR17, SR18, SR19, SR20, SR25, SR26, SR27, SR27, SR28, SR29, SR30, TRE2, TRN1, WMO23, WMO25, WMO26, WMO33, WMO34, WMO35, WMO36, WMO37, WMO38, WMO38 Image: South Ronaldsay TV Run 15 1755	
SS.SSa.CMuSa Circalittoral muddy sand NIS3, NIS4, *TRE1*, TRE4 Image: 9593	

Table 13.2 continued

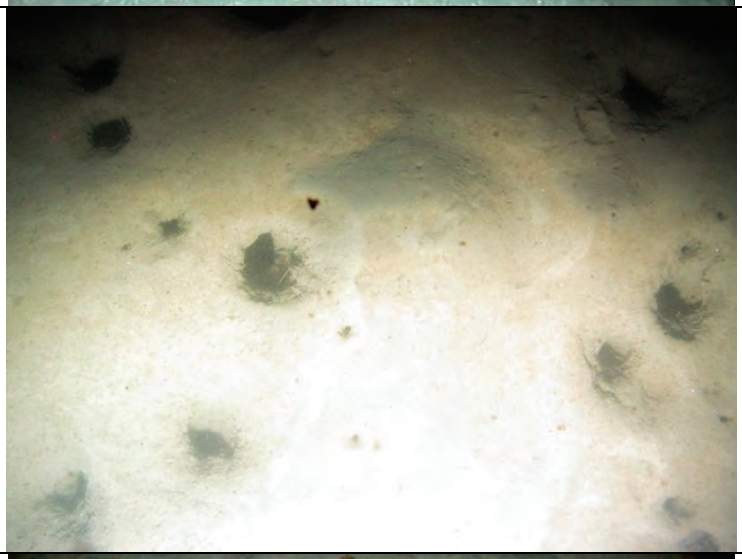
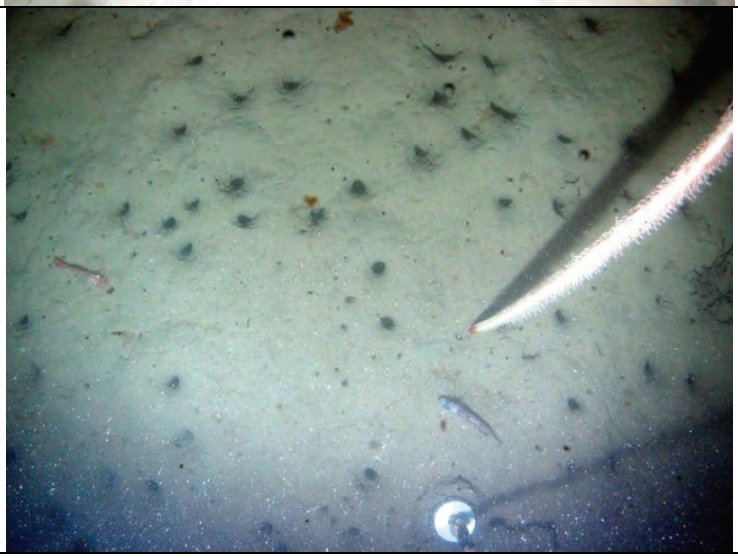
Biotope and Sites	Photograph
SS.SSa.OSa Offshore circalittoral sand *SCTV1*, T7, T8, T20 The image shows *Atrina fragilis* Image: video	
SS.SMu.CFiMu.SpnMeg Seapens and burrowing megafauna in circalittoral fine mud *TRE8* Image: 9669	
SS.SMu.CFiMu.SpnMeg.Fun Seapens, including *Funiculina quadrangularis*, and burrowing megafauna in undisturbed circalittoral fine mud *CITV1*, CITV2, CITV3, KR1/10, T1, T17, T18, T21, T23, T25 Image: 0023	

Table 13.2 continued

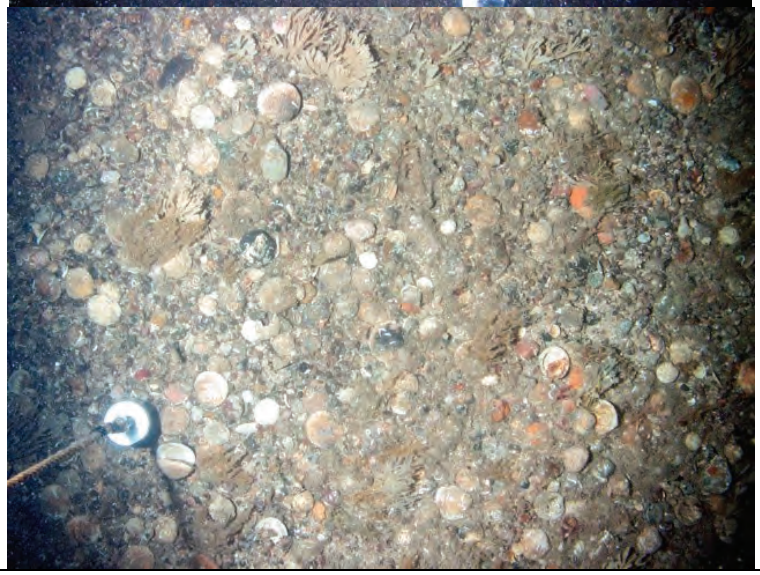
Biotope and Sites	Photograph
SS.SMu.OMu Offshore circalittoral mud *T12*, T23, T24 The image shows *Pachycerianthus multiplicatus* Image: 8934	
SS.SMx.CMx Circalittoral mixed sediment KR2/10, NH22/D6, SF4, SF5, SF6, SF7, SF8, SF9, SF10, SF12, SF13, SF15, SF16, SF17, SF18, *TRE2*, WMO37, WMO39, WMO40 Image: 9598	
SS.SMx.CMx.FluHyd *Flustra foliacea* and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment LW28, MOK27, *MOK30*, MOK32, SR10, SR13, SR21, WMO46 Image: 7240	

Table 13.2 continued

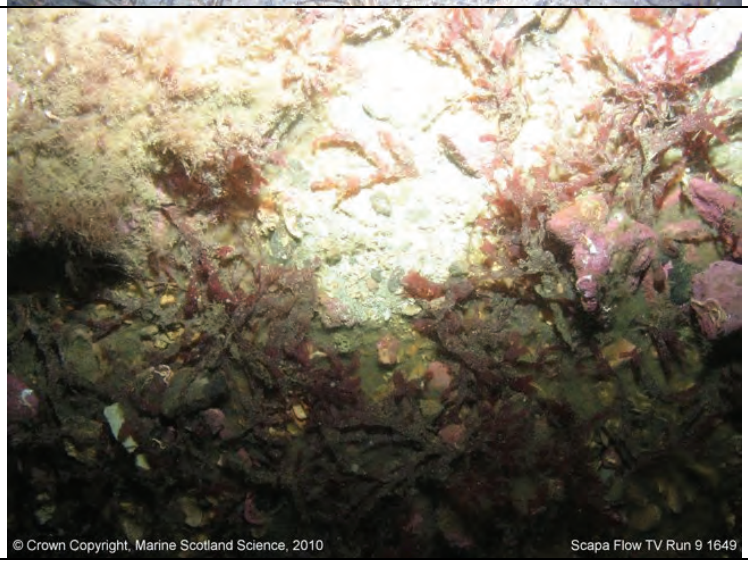
Biotope and Sites	Photograph
SS.SMx.CMx.OphMx *Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment *MOK29*, MOK31, NH22/D6, NH22/D7 Image: 7226	
SS.SMx.OMx Offshore circalittoral mixed sediment *T3*, T4, T5, T7, T8, T8, T9, T10, T12, T15, T16, T16, T17, T19, T24, T25, T26 The image shows a field of *Leptometra celtica* Image: 8739	
SS.SMp.KSwSS.Pcri Loose-lying mats of *Phyllophora crispa* on infralittoral muddy sediment SF5, SF6, *SF7*, SF9, SF14 Image: Scapa Flow TV Run 9 1649	

Table 13.2 continued

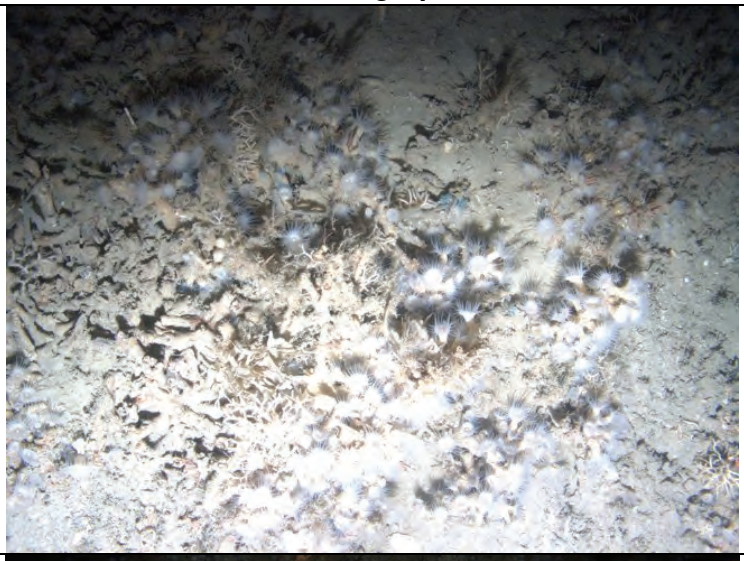
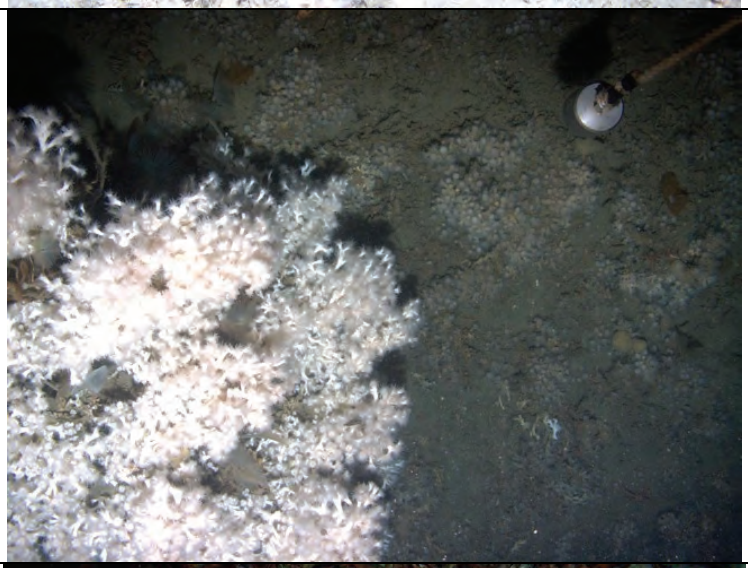
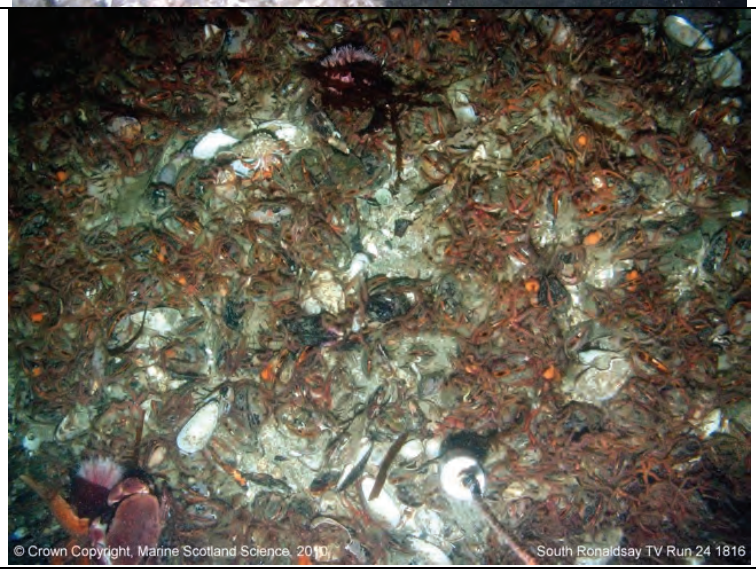
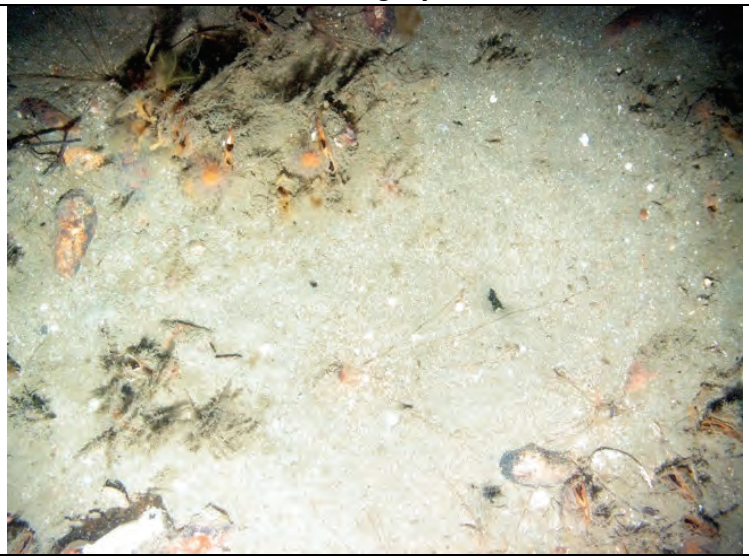
Biotope and Sites	Photograph
SS.SBR.Crl Coral reefs T11, *T12*, T26 The image shows coral rubble densely colonised by *Parazoanthus anguicomus* Image: 8915	
SS.SBR.Crl.Lop *Lophelia* reefs *T12*, T13, T14 Image: 8918	
SS.SBR.SMus.ModT *Modiolus modiolus* beds with hydroids and red seaweeds on tide-swept circalittoral mixed substrata NH21/D1, NH21/D2, NH21/D3, NH22/D2, NH22/D3, NH22/D3, NH22/D4, NH22/D5, *SR24* Image: South Ronaldsay TV Run 24 1816	

Table 13.2 continued

Biotope and Sites	Photograph
SS.SBR.SMus.ModCvar *Modiolus modiolus* beds with *Chlamys varia*, sponges, hydroids and bryozoans on slightly tide-swept very sheltered circalittoral mixed substrata *SCTV2*, SCTV3 Image: 0007	

Appendix 4 Overview of Marine Recorder data supply

The data have been entered into Marine Recorder as 17 surveys corresponding to the different locations and years. The survey names are as follows:

- 2010 MSS Fair Isle seabed camera survey
- 2010 MSS West Mainland Orkney seabed camera survey
- 2010 MSS North Westray seabed camera survey
- 2010 MSS South Ronaldsay seabed camera survey
- 2010 MSS Scapa Flow seabed camera survey
- 2009 MSS Sound of Stroma seabed camera survey
- 2010 MSS Sound of Stroma seabed camera survey
- 2010 Aquatera Noss Head ROV survey
- 2010 MSS Lewis seabed camera survey
- 2010 MSS Crowlin Islands seabed camera survey
- 2009 MSS Kyle Rhea seabed camera survey
- 2010 MSS Kyle Rhea seabed camera survey
- 2010 MSS Sound of Canna seabed camera survey
- 2010 MSS Tiree seabed camera survey
- 2010 MSS Islay North seabed camera survey
- 2009 MSS Mull of Kintyre seabed camera survey
- 2010 MSS Mingulay seabed camera survey

Each survey has been divided into events (31 in total) corresponding to the different days of operation. For example the following events are employed for the West Mainland Orkney survey:

- West Mainland Orkney camera survey 09 Sep 2010
- West Mainland Orkney camera survey 10 Sep 2010
- West Mainland Orkney camera survey 11 Sep 2010

For each survey, samples correspond to video runs (sites) unless the runs have been split into segments of different biotopes, in which case the segments are regarded as samples. There is a total of 242 samples. Samples are encoded using the Site ID, with segments also given a numerical suffix (i.e. ID.x, where ID is the site ID and x is an integer).

For each sample the following data are supplied:

- Positional coordinates for the start and end of the sample, where these are available. Where tracking data has not been supplied and the video run has been split into segments, the start and end coordinates are those for the entire run.

- Depth below chart datum for the start and end of the sample. These have not been supplied to the contractor for most of the surveys and so have been extracted from the plotted positions on Admiralty charts.

- Description of the physical and biological characteristics of the sample, the SACFOR abundances and the biotopes present

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